Engine 83 Recommendation

Recommendation from the committee for Engine 83

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Recommendation from the committee for Engine 83

Scope

To specify a new fire apparatus for the new fire station 83 which would be capable of providing advanced life support as well as function as a pumping apparatus which is equipped to handle hazardous materials and technical rescue responses. Release specifications for bid on this apparatus and evaluate bids for recommendation of purchase.

E-83 Committee

The committee for this project was comprised of Westfield Fire Department members. Six members were chosen based on their experience, knowledge of vehicular mechanics, operations of the apparatus, and the process of apparatus specifications and purchasing. Collectively the personnel listed represent over 100 years of service.

- Battalion Chief Mike Sherley
- Captain Joe Lyons
- F.F. Chad Everitt
- F.F. Mitch Hazelbaker
- F.F. Chris Dickover

Goals

The primary goal was to design an apparatus that would be built similar to the ones we currently operate with the addition of Advanced Life Support equipment in order to simplify operations.

The secondary goal was to use a vendor which is able to provide a service facility within a 50 mile radius of the City of Westfield. There are vendors of fire apparatus in Indiana which do not provide a service facility in this state.

Additionally we want to provide a quality apparatus to serve the community.

Objectives

Currently we operate two identical apparatus which simplify operations by standardizing location of equipment. The committee analyzed the functionality of our current design to determine if any changes were needed. It was determined that minor changes were needed for safety and ease of use. The addition of another station creates the need for the additional apparatus. To keep operations standardized this apparatus has been designed to be as close to the current apparatus as possible. We were informed by Fire Chief Burtron in the beginning that this would be an Advanced Life Support apparatus. With the need to transport additional equipment, extra compartment space was provided in the cab for the needed climate control.

As with any vehicle there is a need for service & maintenance to be performed to ensure reliable operation. Currently we have on duty firefighters certified as Emergency Vehicle Technicians (EVT). This allows WFD to perform routine maintenance to our fleet as a cost savings to the City. However, there are instances when the needed maintenance or repairs are beyond the capabilities of our in-house mechanics. For this reason we feel it is important to have a vendor that can provide a fixed service facility within reasonable distance of Westfield. There are only three vendors of fire apparatus in central Indiana which have facilities meeting this criterion of service. By choosing a vendor with a fixed local facility we minimize out of service time for the apparatus, and increase the availability of service options.

It is vitally important to have an apparatus built with quality and attention to detail. Since the January 2010, members of the committee traveled to the apparatus factories the vendors represent to inspect the processes each factory utilizes. Although many of the same components are utilized by the different builders, they each have different construction, engineering, and quality control differences which make each builder unique.

Specifications

Specifications for the apparatus were developed after assessing our current operations and future needs. Furthermore, after conducting on-site visitation and inspection of the manufacturing facilities the specifications for this apparatus finalized. These specifications were then released for vendors to obtain after the advertisement pursuant to IC 5-3-1-2-E.

Advertisement

The first advertisement for the bid was in the Noblesville Daily Times on May 12th, 2010 and followed by the second advertisement on May 19th, 2010. Advertised due date was 5-24-2010. Due to mistake by Noblesville Daily Times an addendum was added to bid specifications to change bid openings until 5-26-2010.

Vendors

The following vendors picked up specifications from the City of Westfield Fire Department located at 17535 Dartown Rd. Westfield, In. 46074.

- Donley Safety, representing Kovatch Mobile Equipment (KME)- Mike Smith on 5-12-2010
  5546 Elmwood Ct.
  Indianapolis, In. 46203 ***Submitted bid proposal***

- Hoosier Fire, representing Smeal Fire Apparatus
  Tim Hodson on 5-12-2010
  3863 N. Commercial Parkway
  Greenfield, In. 46140 ***Did not submit bid proposal***

- Global Emergency Products, representing Pierce Manufacturing
  John Mullins on 5-13-2010
  4212 Perry Blvd.
  Whitestown, In.46075 ***Did not submit bid proposal***
- Towers Fire Apparatus, representing Crimson Fire
  Linda Baker on 5-14-2010
  502 S. Richland
  Freesburg, Il. 62243 ***Did not submit bid proposal***

- Global Emergency Products, representing Pierce Manufacturing
  John Elderson on 5-19-2010
  4212 Perry Blvd.
  Whitestown, In.46075 ***Did not submit bid proposal***

Bids Received

- On May 26th, 2010 at 3:15PM, Mike Smith of Donley Safety submitted a sealed bid.

- Notification by phone from Gary Davison from Global Emergency Products was received that Global Emergency Products would not be submitting a bid.

- No other bids were received.

Recommendation

It is the recommendation of the committee to proceed with the purchase of the fire apparatus from Donley Safety for the bid price of $482,980.00. Donley Safety represents KME Fire Apparatus which is one of the builders whose factory we inspected. The quality of apparatus that we witnessed being produced meets the committee's requirements.

The apparatus specified in this bid is priced with a 2009 crated (new) Cummins engine; which there are very limited quantities. Effective January 2010, Environmental Protection Agency (EPA) emission regulations *(40 CFR part 86)* for diesel vehicles have resulted in significant price increases. However, the listed bid reflects pricing based on their inventory of 2009 Cummins diesel engine which equates to a **$25,000 cost reduction** along with an **annual cost avoidance of $250** for Diesel Exhaust Fluid (DEF). In the event the City of Westfield would require this apparatus to go back to bid we would not be able to specify the 2009 model Cummins engine and would have to specify the 2010 engine

The specification of the 2009 model year Cummins engine was deliberate in order to reduce initial purchase costs as well as operating costs. The 2010 model year engines are required to meet a different EPA requirement which includes a urea system which have

The opportunity for vendors to submit bids was equal. The committee has made a conscious effort to provide a quality apparatus from a vendor that can provide a service facility and be fiscally responsible in our choice of engine.

KME FIRE APPARATUS

By Kovatch Mobile Equipment Corp.

One Industrial Complex – Nesquehoning, PA 18240
(570) 669-5132 [Phone] - (570) 669-5124 [Fax]
www.kovatch.com URL

APPARATUS PROPOSAL

DATE: May 26, 2010

FOR: City of Westfield Fire Department

MAILING ADDRESS:17535 Dartown Rd.,

Westfield, Hamilton County, IN 46074

Bidder hereby proposes to manufacture and furnish to Purchaser, subject to Purchaser's acceptance of the Bidder's proposal and the proper execution of the appropriate contract, the following apparatus and equipment to be built in accordance with the attached specifications, whether purchase is made via KME contract or customer purchase order. The vehicle will be built to the purchaser's specifications.

Quantity: 1 or more KME Model: Custom Pumper on Predator Chassis as per the Department Specifications.

For the sum of **$482,980.00** Dollars each. (Plus applicable taxes if any)

TOTAL:$482,980.00 **Additions and Deletions may be taken at Standard Cost**

Delivery is to be made subject to all clauses of the attached contract, within approximately 270 calendar days from receipt of the **signed pre-construction letter of acceptance** by the Company. Company will not be liable for any delay, failure to make delivery, or other default due to strikes or labor unrest, war, riot, federal, state or local government action, fire, flood or other disaster or acts of God, accidents, breakdown of machinery, lack of or inability to obtain materials, parts or supplies, or any other causes or circumstances beyond the reasonable control of Company which prevent or hinder Company's manufacture and/or delivery of the Apparatus. The Bidder's right to withdraw this proposal, if not accepted within thirty (30) days from the above date is hereby acknowledged.

Respectfully submitted by,

_____
Sales Representative

Donley Safety
Company

5546 Elmwood Ct.
Address

Indianapolis, IN 46203
City, State, Zip

(317) 786-2268
Phone Number

KME Fire Apparatus
Apparatus Manufacturer

One Industrial Complex
Address

Nesquehoning, PA 18240
City, State, Zip

(**800) 235-3928**
Phone Number

KME FIRE APPARATUS

CUSTOM PUMPER

BID PROPOSAL SPECIFICATIONS

FOR THE

WESTFIELD FIRE DEPARTMENT
May 28, 2010

Table of Contents

GENERAL INFORMATION

The proposed apparatus will be constructed to withstand the severe and continuous use encountered during emergency fire fighting services. The apparatus shall be of the latest type, carefully designed and constructed with due consideration to the nature and distribution of the load to be sustained.

These specifications detail the proposal for general design criteria of cab and chassis components, aerial device (if applicable), fire pump and related components (if applicable), water tank (if applicable), fire body, electrical components, painting, and equipment.

All items of these proposal specifications will conform to the National Fire Protection Association Pamphlet No. 1901, latest edition.

KME will furnish satisfactory evidence of our ability to construct, supply service parts and technical assistance for the apparatus specified.

FIRE APPARATUS DOCUMENTATION

The contractor will supply, at the time of delivery, at least one (1) copy of the following documents:

The manufacturer's record of apparatus construction details, including the following information:

- Owners name and address
- Apparatus manufacturer, model and serial number
- Chassis make, model and serial number
- Front tire size and total rated capacity in pounds
- Rear tire size and total rated capacity in pounds
- Chassis weight distribution in pounds with water and manufacturer mounted equipment, front and rear
- Engine make, model, serial number, rated horsepower, rated speed and governed speed
- Type of fuels and fuel tank capacity
- Electrical system voltage and alternator output in amps.
- Battery make, model and total capacity in cold crank amps (CCA)
- Transmission make, model and serial number. If so equipped chassis transmission PTO(s) make, model and gear ratio
- Pump make, model, rated capacity in gallons per minute (liters per minute where applicable) and serial number
- Pump transmission make, model, serial number and gear ratio
- Auxiliary pump make, model, rated capacity in gallons per minute (liters per minute where applicable)and serial number
- Water tank certified capacity in gallons or liters
- Paint manufacturer and paint number(s)

Certification of slip resistance of all stepping, standing and walking surfaces.

If the apparatus has a fire pump or an industrial supply pump, the pump manufacturer's certification of suction capability.

If the apparatus has a fire pump or an industrial supply pump, a copy of the apparatus manufacturer's approval for stationary pumping applications.

If the apparatus has a fire pump or an industrial supply pump, the engine manufacturers certified

brake horsepower curve for the engine furnished, showing the maximum governed speed.

If the apparatus has a fire pump or an industrial supply pump, the pump manufacturers certification of hydrostatic test.

If the apparatus has a fire pump or an industrial supply pump, the Underwriters Laboratory certification of inspection and test for the fire pump.

If the apparatus has an aerial device the Underwriters Laboratory certification of inspection and test for the aerial device.

If the apparatus has an aerial device, all the technical information required for inspections to comply with NFPA 1911, Standards for Testing Fire Department Aerial Devices.

If the apparatus has a fixed line voltage power source, the certification of the test for the fixed power source.

If the apparatus is equipped with an air system, test results of the air quality, the SCBA fill station, and the air system installation.

Weight documents from certified scale - showing actual loading on the front axle, rear axle(s) and overall vehicle (with the water tank full but without personnel, equipment and hose) will be supplied with the complete vehicle to determine compliance with NFPA-1901

Written load analysis and results of electrical performance tests

If the apparatus is equipped with a water tank, the certification of water tank capacity.

The proposed chassis will be certified by KME as conforming to all applicable federal motor vehicle safety standards (FMVSS) in effect at the date of contract. This will be attested to by the attachment of a FMVSS certify caution label on the vehicle by KME, who will be recognized as the responsible final manufacturer.

KME will be responsible for preparing and maintaining a record file of parts and assemblies used to manufacture the proposed apparatus. These records will be maintained in KME's factory for a minimum of twenty (20) years. The file will contain copies of any and all reported deficiencies, all replacement parts required to maintain the apparatus, and original purchase documents including specifications, contract, invoices, incomplete chassis certificates, quality control reports and final delivery acceptance documents. The purchaser will have access to any and all documents contained in this file upon request.

"TOP OF THE LINE" CHASSIS

KME is proposing a custom built chassis, which is "Top Of The Line" including the cab structure and design, Multiplex electrical system, drive train and frame assembly.

GENERAL CONSTRUCTION

The proposed apparatus, assemblies, subassemblies, component parts, etc., will be designed and constructed with the due consideration to the nature and distribution of the load to be sustained and to the general character of the service to which the apparatus is subjected to when placed in service. All parts of the apparatus will be designed with a factor of safety, which is equal to or greater than that which is considered standard and acceptable for this class of equipment in fire fighting service. All parts of the proposed apparatus will be strong enough to withstand general service under full load.

The apparatus will be so designed that the various parts and readily accessible for lubrication, inspection, adjustment and repair.

A full complement of specified ground ladders, full water tank, loose equipment, and firefighters will be carried without overloading or injuring the apparatus.

The aerial ladder will be designed as a modular component of the apparatus. The aerial ladder, its support structure, and outrigger system will be designed to comprise an integrated assembly, removable from the carrier vehicle as a single self-supporting unit. The design will facilitate repair, modifications or replacement of the aerial device, apparatus body, or chassis individually, as required by wear from use, obsolescence, or for purposes of refurbishment.

SINGLE-LINE RESPONSIBILITY

KME is providing single source manufacturing. KME designs, manufactures and builds our own fire apparatus cab, chassis, body and aerial device. This capability provides a consistent design and manufacturing procedures that will reduce warranty issues and provide ease in parts replacement.

PRODUCT LIABILITY INSURANCE

KME is providing liability and facility insurance equaling $30,000,000.00, which is one of the highest available in the fire industry. Reference attached documentation.

SERVICE CENTER:

Donley Safety, Inc
Indianapolis, Indiana

KME APPARATUS SERVICE STATEMENT

The proposed KME Fire Apparatus vehicle is offered with complete single-source service performed by the regional KME factory authorized service center.

Service is provided by:

Donley Safety, Inc
5546 Elmwood Court
Indianapolis, In 46203
Phone: (800) 345-2268 / (317) 786-2268
Cell: (317) 501- 6906
Fax: (317) 786-2532

Service Center Capabilities

Donley Safety, Inc in Indianapolis, IN. celebrates Twenty Eight (30) years of operation and employs Thirty Eight (28) people. The factory authorized operation employs Ten (5) full-time service mechanics to handle any service-related issues or operational improvements that you may desire.

Donley Safety, Inc employees EVTCC certified technicians**.**

Donley Safety, Inc operates three (2) mobile service trucks that offer In-Station Service repairs to

to your apparatus when needed.

Donley Safety, Inc offers a twenty-four (24) hour service plan in which assigned service personnel cell phones; one (1) man is always on call to handle any truck that is down and out of service.

Donley Safety, Inc offers sheet metal repair and fabrication, pump and electrical repair, aerial ladder service and repair, booster tank repair and replacement, and minor or major refurbishment capabilities.

Donley Safety, Inc offers factory authorized service and repairs to all makes of fire apparatus equipped with Hale, Waterous and Darley Pumps.

Donley Safety, Inc employees are protected by Workmans Compensation Insurance. A 1 Million Dollar Garage Keepers Liability Insurance Coverage and a 25 Million Dollar Product Liability Insurance Policy protect your fire department and your fire department equipment.

PRICES AND PAYMENTS

The bid price will be F.O.B. Destination, on a delivered and accepted basis at the Fire Department.

Total price on KME's proposal sheet will include all items listed in these specifications. Listing any items contained in the specification as an extra cost item, unless specifically requested to do so in these specifications, will automatically be cause for rejection.

KME will compute pricing less federal and state taxes. It is understood that any applicable taxes will be added to the proposed prices, unless the purchaser furnishes appropriate tax-exempt forms.

DELIVERY TIME

KME is proposing to complete the apparatus delivery time based on the number of calendar days, starting from the date the sales contract is signed and accepted by KME Fire Apparatus.

Delivery Time: 270 Calendar Days after signed pre-con documents

BOND REQUIREMENTS

An original bid bond will be submitted with the KME's proposal. The bond will be for an amount equal to 10% of the proposed bid price.

KME's bonding company will meet the following requirements:

- An acceptable surety as outlined by the department of treasury on their most recent federal register at a limit of at least $10,000,000;
- A.M. Best rating of "A" or better with a financial rating of at least "VIII"; and licensed as a surety in the state where the sale is to be made.

PERFORMANCE BOND

A performance bond will be supplied by the KME upon acceptance of the signed sales contract for the apparatus. The performance bond will be for an amount equal to the full contract price (i.e. 100% bond).

MATERIAL AND WORKMANSHIP

All equipment furnished will be guaranteed to be new and of current manufacture, to meet all requirements of purchaser's specifications.

All workmanship will be of high quality and accomplished in a professional manner so as to insure a functional apparatus with a pleasing, aesthetic appearance.

APPROVAL DRAWING

A detailed drawing of the apparatus will be provided to the Westfield Fire Department for approval before construction begins. A copy of this drawing shall also be provided to the manufacturer's representative. Upon Westfield Fire Department approval, the finalized drawing shall become a part of the total contract.

The drawing shall show, but is not limited to, such items as the chassis make and model, major components, location of lights, sirens, all compartment locations and dimensions, special suctions, discharges, etc. The drawing shall be a visual interpretation of the apparatus as it is to be supplied.

INSPECTION VISITS

KME will provide two (2) factory inspection trips to KME's facility. Transportation, meals, lodging, and other requisite expenses will be the bidder's responsibility.

Accommodations shall be for three (3) Fire Department representatives per trip.

The factory visits shall occur at the following stages of production of the apparatus:

- Pre-construction / blueprint review.
- Final inspection upon completion.

Travel arrangements greater than 200 miles from the manufacturing facility shall be via commercial airline transportation. No Exception.

The customer maintains the right to inspect the apparatus, within KME's normal business hours. At any other point during construction expenses incurred during non-specified visits shall be the responsibility of the customer.

During inspection visits, the customer reserves the right to conduct actual performance tests to evaluate completed portions of the unit. Testing shall be accomplished with the assistance and resources of the contractor.

DELIVERY

Delivery of the apparatus to the Fire Department will remain KME's responsibility.

A qualified and responsible representative of KME will deliver the apparatus to the Fire Department.

INSTRUCTION MANUALS/DRAWINGS, SCHEMATIC

KME will supply at time of delivery, two (2) copies of a complete operation and service manual covering the complete apparatus as delivered and accepted.

The manual will contain the following:

- Descriptions, specifications, and ratings of chassis, pump (if applicable), and aerial device (if applicable).
- Wiring diagrams
- Lubrication charts
- Operating instructions for the chassis, any major components such as a pump and any auxiliary systems.
- Instructions regarding the frequency and procedures recommended for maintenance.
- Parts replacement information.

VEHICLE FLUIDS PLATE

As required by NFPA-1901, KME will affix a permanent plate in the driver's compartment specifying the quantity and type of the following fluids used in the vehicle:

A permanent plate in the driving compartment will specify the quantity and type of the following fluids used in the vehicle:

- Engine oil
- Engine coolant
- Chassis transmission fluid
- Pump transmission lubrication fluid
- Pump primer fluid
- Drive axle(s) lubrication fluid
- Air-conditioning refrigerant
- Air-conditioning lubrication oil
- Power steering fluid
- Cab tilt mechanism
- Transfer case fluid
- Equipment rack fluid
- Air compressor system lubricant
- Generator system lubricant
- Aerial systems

PRINCIPAL APPARATUS DIMENSIONS & G.V.W.R.

The principal dimensions of the completed apparatus will not exceed the following maximum acceptable dimensions:

KME PROPOSED DIMENSIONS:

- OVERALL LENGTH: 412"
- OVERALL WIDTH: 100"
- OVERALL HEIGHT: 111.5"
- WHEELBASE: 227"

The axle and total weight ratings of the completed apparatus will not be less than the following minimum acceptable weight ratings:

- MINIMUM FRONT G.A.W.R.: 20,000 lbs.
- MINIMUM REAR G.A.W.R.: 31,000 lbs.
- MINIMUM TOTAL G.V.W.R.: 51,000 lbs.

KME will include the principal dimensions, front G.A.W.R., rear G.A.W.R., and total G.V.W.R. of the proposed apparatus. Additionally, KME will provide a weight distribution of the fully loaded, completed vehicle; this will include a filled water tank, specified hose load, miscellaneous equipment allowance in accordance with NFPA-1901 requirements, and an equivalent personnel load of 250 lbs. per seating position.

CONTINGENCY FUND

An allowance of $10,000.00 is included in the proposal price to be used by the Westfield Fire Department for additional options or equipment. In the event this fund is not utilized completely, the remaining funds will be credited back to the Westfield Fire Department.

FAMA MEMBERSHIP

KME Fire Apparatus is a leading and proud member of the Fire Apparatus Manufacturer's Association (FAMA).

U.S.A. MANUFACTURER

The entire apparatus shall be assembled within the borders of the Continental United States to insure more readily available parts (without added costs and delays caused by tariffs and customs) and service.

QUALITY MANAGEMENT

KME Fire Apparatus operates a Quality Management System under the requirements of MIL-I-45208A, a military specification for a quality inspection system established to substantiate product conformance to drawings, specifications, and contract requirements. A copy of the certificate of compliance will be included in the bid.

AMP DRAW REPORT

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

A written load analysis, which shall include the following:

- The rating of the alternator.
- The minimum continuous load of each component that is specified per: Applicable NFPA-1901.

- Additional loads that, when added to the minimum continuous load, determine the total connected load.
- Each individual intermittent load.

All of the above listed items shall be provided by the bidder per the applicable NFPA-1901.

COOPERATIVE PURCHASING

The Manufacturer will be pleased to allow other public agencies to use the purchase agreement resulting from this invitation to bid unless the bidder expressly notes on the proposal form that prices are not available for tag-on. The condition of such use by other agencies will be that any such agency must make and pursue contact, purchase order/contract, and all contractual remedies with the successful bidder. Such tag-ons will be done so that the original purchasing agency has no responsibility for performance by either the manufacturer or the agency using the contract.

2007 ENGINE AVAILABILITY DISCLAIMER

You have chosen a "2007 emission compliant" diesel engine; this engine is subject to availability on hand at the time of order of apparatus from Kovatch Mobile Equipment. Time of order means date of acceptance by KME of a valid purchase order or written sales contract with a fully completed order entry package, and the return of an order acknowledgement letter from KME, which includes an assigned General Shop Order Number ("GSO #") and Sales Engineer. This confirmation must expressly state that the engine selection is confirmed and will be included in your order. Based on impending 2010 EPA federal emission changes, the 2007 emission compliant engines are in limited supply and inventory can/may be depleted at any point in time.

If at time of order from KME the selected engine is no longer available, KME cannot be held responsible for nor participate in any additional costs resulting from modification of the order to provide a viable and available engine offering. These costs could include, but are not limited to, changing engine manufacturer, horsepower, or upgrading to a 2010 emission compliant engine. Additional engine order content, and related costs, could be affected if a different 2007 EPA emission compliant engine is required to be substituted due to unavailability of the selected engine. These costs may also include those resulting from required changes in associated order option content necessitated by substitution of an alternative engine. Such charges could include but are not limited to changing the transmission model or cab type. KME will work with each customer in an effort to minimize changes while meeting the customer's requirements and specifications as closely as possible.

PLEASE NOTE: IT IS POSSIBLE THAT AN ENGINE SHORTAGE WILL OCCUR FOR THE 2010 MODEL YEAR, WHICH MAY RESULT IN A DELAY IN PRODUCTION OF SOME 2010 MODEL YEAR VEHICLES. KME IS MAKING EVERY REASONABLE EFFORT TO AVOID SUCH A DELAY, BUT IS NOT RESPONSIBLE FOR ANY ACTUAL DELAY THAT OCCURS AS THE DIRECT RESULT OF AN ENGINE SHORTAGE.

Any other written or verbal statements, agreements or representations made regarding 2007 emission compliant engines or their availability are superseded by the foregoing statements regarding the sale and availability of 2007 EPA emission compliant engines by KME.

GENERAL APPARATUS DESCRIPTION "PUMPER"

The unit shall be designed to conform fully to the "Pumper Fire Apparatus" requirements as stated in the NFPA 1901 Standard (2009 Revision), which shall include the following required chapters as stated in this revision:

- Chapter 1 Administration
- Chapter 2 Referenced Publications
- Chapter 3 Definitions
- Chapter 4 General Requirements
- Chapter 5 Pumper Fire Apparatus
- Chapter 12 Chassis and Vehicle Components
- Chapter 13 Low Voltage Electrical Systems and Warning Devices
- Chapter 14 Driving and Crew Areas
- Chapter 15 Body, Compartments and Equipment Mounting
- Chapter 16 Fire Pumps and Associated Equipment
- Chapter 18 Water Tanks

CAB SAFETY SIGNS

The following safety signs shall be provided in the cab:

- A label displaying the maximum number of personnel the vehicle is designed to carry shall be visible to the driver.
- “Occupants must be seated and belted when apparatus is in motion” signs shall be visible from each seat.
- “Do Not Move Apparatus When Light Is On” sign adjacent to the warning light indicating a hazard if the apparatus is moved (as described in subsequent section).
- A label displaying the height, length, and GVWR of the vehicle shall be visible to driver.
- This label shall indicate that the fire department must revise the dimension if vehicle height changes while vehicle is in service.

CHASSIS DATA LABELS

The following information shall be on labels affixed to the vehicle:

Fluid Data

- Engine Oil
- Engine Coolant
- Chassis Transmission Fluid
- Pump Transmission Lubrication Fluid
- Pump Primer Fluid (if applicable)
- Drive Axle(s) Lubrication Fluid
- Air Conditioning Refrigerant
- Air Conditioning Lubrication Oil
- Power Steering Fluid
- Cab Tilt Mechanism Fluid
- Transfer Case Fluid (if applicable)
- Equipment Rack Fluid (if applicable)

- Air Compressor System Lubricant
- Generator System Lubricant (if applicable)
- Front Tire Cold Pressure
- Rear Tire Cold Pressure
- Aerial Hydraulic Fluid (if applicable)
- Maximum Tire Speed Rating

Chassis Data

- Chassis Manufacturer
- Production Number
- Year Built
- Month Manufactured
- Vehicle Identification Number

Manufacturers weight certification:

- Gross Vehicle (or Combination) Weight Rating (GVWR or GCWR)
- Gross Axle Weight Rating, Front
- Gross Axle Weight Rating, Rear

ROLLOVER STABILITY

The apparatus shall meet the criteria defined in 4.13.1 for rollover stability as defined in the 2009 NFPA Standard for Automotive Fire Apparatus.

****** CAB AND CHASSIS ******

"PREDATOR" CAB TYPE

- **FULL TILT**
- **CONTOUR WINDSHIELD**

The cab shall be a custom tilt style, built specifically for fire service. The cab shall be a cab over engine design, with integral tilt mechanism and engine access from inside the cab.

Cab shall be designed, fabricated, assembled in its entirety, and installed on the frame rails in the factory of the bidder. This requirement shall eliminate any split responsibility in warranty and service. NO EXCEPTIONS TO THIS REQUIREMENT.

OPEN SPACE DESIGN

The cab interior shall be the "Open-Space" design with no wall, support posts or window between the front and rear crew area to allow direct communication, better visibility and air circulation in the cab.

CAB MATERIAL

The cab shall be fabricated from 5052-H 32 aluminum alloy, utilizing the minimum material thickness as follows:

- Cab side panels 0.125 thick (1/8")
- Cab roof 0.125 thick (1/8")
- Forward cab front sheet 0.125 thick (1/8")
- Interior cab panels 0.125 thick (1/8")

- Other panels 0.125 thick (1/8")
- Cab doors 0.1875 thick (3/16")
- Engine enclosure side panels 0.250 thick (1/4")

CAB - BASE CONSTRUCTION

Cab sub-frame shall be a welded assembly fabricated of 6063 structural aluminum alloy. This frame shall extend the full length and width of the cab and be secured to the chassis frame through two (2) rear urethane self centering load cushions, two (2) forward pivot brackets, and two (2) cab locks. The cab shall be of entirely welded construction.

The front cab wall shall be of double wall type construction, featuring an inner and outer panel. (No Exceptions)

CRASH TESTING CERTIFICATION

To ensure the safety of the cab occupants and cab integrity, proof of third party testing shall be provided. The cab shall be certified for SAEJ2422 side impact, SAEJ2420 with ECER29 cab front impact, and ECER29 cab roof strength. NO EXCEPTIONS

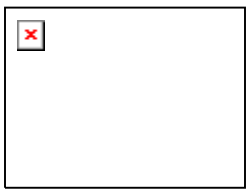
DIMENSIONS - EXTENDED LONG FOUR DOOR STYLE CAB

Minimum Cab Dimensions:

- Overall width 96"
- Inside width across ceiling 88"
- Front area floor to ceiling 63"
- Top of front seat to ceiling 44" (depending upon seat type)
- Seat back to steering wheel 22" (depending upon seat type)
- Inside width (door to engine enclosure) 25" (driver's side, at floor)
- Inside width (door to engine enclosure) 22-1/2" (officer's side, at floor)
- Crew seat area width 88"
- Outer crew seat risers to rear wall 59-1/2"
- Centerline axle to rear wall 77-1/2"
- Rear of engine enclosure to rear cab wall 60"
- Centerline axle to front of cab 74"
- Floor to top of engine enclosure 31-1/2"

Glass Area Dimensions:

- Windshield (Contour) 2,900 sq. in.
- Front door window, retractable 743 sq. in. each
- Rear door window, retractable 875 sq. in. each
- Side fixed crew windows 620 sq. in. each



Cab Entry Door Dimensions

- Forward door opening 73" high x 37" wide
- Forward door recessed step 30" wide by 8-1/2" deep
- Rear door opening 85-3/4" high x 31" wide
- Rear door recessed step 20" wide x 8-1/2" deep

CAB ROOF

The roof shall be of a split level design with radius edges for an aesthetic, streamline appearance. The roof shall be constructed the same material as the main structure and shall be internally reinforced using framing which shall span the entire width and length of the cab for maximum structural integrity. This shall allow the roof to support personnel and roof mounted equipment without the need for additional reinforcement.

The cab roof over the rear crew area shall be raised twelve (12) inches higher than the front driver and officer area. The front face of the raised roof section shall be sloped at a 45 degree angle, creating a streamlined interface with the standard, lower, forward roof section. This design shall allow for additional interior height in the rear crew area.

The rear crew area doors shall be "Vista-Style", extending full height to the radius edge of the raised roof.

Approximate dimensions:

- Crew area floor to ceiling 65-1/2"
- Top of crew seat to ceiling 47" (depending upon seat type)

CAB ROOF DRIP RAIL

For enhanced protection from inclement weather, a drip rail shall be furnished on the sides of the cab. The drip rail shall be constructed of bright polished extruded aluminum, and be fastened to the sides of the cab rood edge. The drip rail shall extend the full length of the cab roof.

CAB DOORS

Four (4) side-opening doors shall be provided. The cab doors shall be totally aluminum construction with an extruded aluminum frame and a 3/16" thick aluminum outer door skin. Doors shall be full height from the step to the cab roof rain gutter and enclose the step area when the doors are closed.

The forward cab door opening shall be a minimum of 37" wide, and the rear cab door opening shall be a minimum of 31" wide. The rearward cab doors shall have a radius cutout allowing the door opening to protrude forward over the cab wheel well, while providing full access to the rear crew area.

There shall be a heavy duty piano type stainless steel hinge on each door with a minimum pin diameter of 5/16". Hinges shall be slotted for ease of horizontal and vertical adjustment. There shall be a cab door seal and the doors shall close flush with the side of the cab, any overlap closure shall not be acceptable. A heavy-duty 6" wide belting material shall be utilized to prevent the cab doors from opening greater than 90 degrees.

ENTRY STEP AREA

Each of the forward entrance steps shall be a minimum of 8-1/2" deep x 30" wide with the floor board recessed a minimum of 3" to avoid "shin knocking". Each step shall be fabricated as an integral part of the cab construction. The cab step and risers shall be overlaid with bright finish aluminum tread plate.

Each of the rear entrance steps shall be a minimum of 8-1/2" deep x 20" wide. An intermediate step shall be provided between the lower entrance step and the crew area floor for ease of entry and egress. Each set of steps and respective step risers shall be constructed as an integral part of the cab construction and shall be overlaid with bright finish aluminum tread plate.

AUXILIARY CAB STEPS

An auxiliary cab step shall be provided under each front cab door, outside of the cab. The step shall be constructed from aluminum with brushed aluminum on the vertical supports. The stepping surface shall be Grip-Strut anti-slip material.

AUXILIARY CAB STEPS

An auxiliary cab step shall be provided under each rear cab door, outside of the cab. The step shall be constructed from aluminum with brushed aluminum on the vertical supports. The stepping surface shall be Grip-Strut anti-slip material.

DOOR LATCHES

Heavy-duty, bright finish cast paddle latches shall be provided on the interior and exterior of each cab door. Door latch mechanisms which utilize spring steel clamps shall not be considered due to their tendency to both rust and break. The interior door latch cables are to be designed to reduce adjustment or possible wear at the adjustment turnbuckles.

DOOR WINDOWS

Each side cab door shall have a tinted retractable window operated by a hand crank mechanism. The window track shall be designed into the door frame extrusion, which shall be extruded with a track groove to house a window track and seal. The window shall be capable of being removed from an access slot designed in the bottom of the door frame.

Each side cab door window shall be designed with a custom extruded trim plate, which shall conform to the perimeter of the window opening in each door. The trim plate shall extend from the edge of the door skin to the window and shall have a silver anodized finish.

INNER DOOR PANELS

The cab door interior panels shall be covered with a one piece, full height, brushed aluminum panel for ease of maintenance. The panel shall be 1/8" aluminum with a brushed finish and shall be designed to allow easy access to the inner door.

Each interior cab door panel shall be equipped with reflective ScotchLite material that shall cover at least 96 in^2.

CAB DOOR FRAME AND JAMB SCUFF PLATES

A polished stainless steel trim plate shall be provided rearward of each cab door opening to protect the vertical cab corner rearward of the door opening and on the cab door striker posts to protect the cab paint when exiting and entering the cab.

TRANSVERSE EXTERIOR CAB COMPARTMENTS

Two (2) compartments shall be provided, to the rear of the crew cab doors. The compartments shall be approximately 38" high, 20" wide and 25 3/4" deep in the lower area and transverse above the frame rails. The transverse section shall be approximately 20" wide x 18" high. The transverse section shall be designed to be capable of being utilized for a seat riser. To make the compartment accessible from inside the crew area the front wall of the transverse section shall be with two (2) flat panel drop down doors.

The exposed section of the compartment in the rear crew area shall be painted with a textured paint to match the cab interior. The interior of the compartment shall be painted to match the color or material provided in the body compartments.

Compartment door shall have a 3/16" aluminum exterior skin door with a one (1) inch box pan and a stainless steel "D" ring handle. Door shall be hinged on the forward edge with a stainless steel vertical piano hinge so it opens toward the rear cab door. The door shall be held in the open position by a gas shock stay arm.

Each compartment shall contain a flush mounted light for illumination of the compartment and shall be wired to a door jamb switch to automatically come on when the door is opened.

WINDSHIELD/GLASS

A one piece, symmetrical, safety glass windshield shall be provided on the cab for the driver and officer providing a clear viewing area. The windshields shall be full width to the center of the front cab support for each side and provide the occupants with a panoramic view. To provide enhanced peripheral vision on each side of the cab, the windshield and cab structure shall be designed with radius corners, which provide a minimum of 8" of glass area, measured from the glass face to the side edge near the door post. The windshield shall consist of three (3) layers; the outer light, the middle safety laminate and the inner light. The thick outer light layer shall provide superior chip resistance, the middle safety laminate layer shall prevent the windshield glass pieces from detaching in the event of breakage and the inner light shall provide yet another chip resistant layer.

The windshield will be a contour design with 2900 sq. in. of area for improved visibility and style. The windshield glass shall be designed so it can be used on either the driver or officer side. Windshields that utilize epoxy or that are bonded to the cab structure will not be acceptable.

WINDSHIELD WIPERS AND WASHER

Dual, electric operated, pantographic type windshield wipers shall be provided. One (1) electric drive motor must be provided for each wiper. Windshield wiper systems which utilize a single motor and a reciprocating actuator arm shall not be considered.

Wipers shall have "HI/LO" and "INTERMITTENT" operating speeds. "HI/LO" speeds shall be controlled by a steering column control, within the turn signal control stem. "INTERMITTENT" operation shall be controlled by a twist switch within the control on the steering column. The wipers shall be of the self-parking type.

Wipers to be park brake cancelling.

Windshield washers shall be electric operated wet-arm type with a 3/4 gallon washer fluid

reservoir, mounted inside the engine enclosure and readily accessible through the engine hatch at the rear of the engine enclosure. The washer control shall be integral with the intermittent wiper control switch.

There shall be individual removable panels on the front face of the cab for access to the wiper motor assemblies.

Park Brake Cancelling:

The windshield wipers shall be wired so as to cease operation when the parking brake is engaged.

The windows provided on each side of the cab behind the forward cab doors shall be deleted.

STATIONARY VIEWING WINDOWS

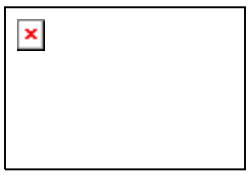
Two (2) 20"H x 7"W stationary viewing windows shall be provided on the rear wall of the cab, one (1) each side, at the outboard edge.

DARK TINTED REAR WINDOW GLASS

The windshield and the forward cab door glass shall be provided with standard DOT green automotive tint. The side cab windows to the rear of the front doors, the rear cab door windows and any rear viewing windows shall be equipped with a dark automotive tint. The use of stick on material shall not be acceptable.

GRAB HANDLES

Four (4) 1-1/4" diameter x 28" long, knurled, bright anodized aluminum handrails shall be provided, one (1) at each cab door entrance. Grab rail stanchions shall be chrome plated and offset when necessary to prevent "hand-pinching" when opening or closing the doors. Formed rubber gaskets shall be provided between each stanchion base and the cab surface.



INTERIOR GRAB RAILS

Four (4) vertically mounted 12” black cast aluminum “D” style entry assist handles shall be installed, one (1) on each side of the cab interior on the “A” post and one (1) on each side of the cab interior on the “C” post in the crew area to assist in entry and exiting of the cab.

Each front cab door shall be provided with one (1) horizontally mounted, 11" long, black cast aluminum "D" style entry assist handle on the interior door panel to assist in entry and exiting of the cab and for closing the door.

Each rear cab door shall be provided with one (1) horizontally mounted, 11" long, black cast aluminum "D" style entry assist handle on the interior door panel to assist in entry and exiting of the cab and for closing the door. Each rear cab door shall also be provided with one (1) horizontally mounted, 30" long black cast aluminum "D" style assist handle, located approximately 8" above the bottom of the window opening.

AIR INTAKE/OUTLET

There shall be a front air intake with a minimum of 945 square inches of open area for maximum air flow to the charge air cooler and the radiator.

Two (2) air inlets/outlets with a minimum of 43.5 square inches per inlet shall be provided horizontally above the wheel well opening, one on each side of the cab. The design shall permit proper ducting of air through the engine compartment and cooling system. The left side inlet, used for the air intake to the air cleaner, shall be equipped with an ember separator for separating water and burning embers from the air intake system. This system shall be such that particles larger than .039 inches (1 mm) in diameter can not reach the air filter element.

The air intake and outlets shall be covered with polished stainless steel louvers, secured with polished cast aluminum housings.

WHEEL WELL LINERS

The front cab wheel wells shall be equipped with fully removable, bolt-in, aluminum inner wheel well liners. The liners shall extend full depth into the truck frame. The completely washable wheel well liners shall be designed to protect the cab substructure, inner panels, and other miscellaneous installed components from road salts, debris, dirt accumulation and corrosion. Fender liners which are fixed partially removable or one piece liner/fenderette shall not be considered.

FENDERETTES

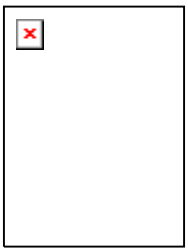
The cab wheel well openings shall be trimmed with replaceable, bolt-in, polished aluminum fenderettes. The fenderettes shall be secured to the cab with stainless steel threaded fasteners along the internal perimeter of the wheel well. Rubber welting shall be installed between the fenderettes and the cab side panel.

MUD FLAPS

Heavy duty, black rubber type mud flaps shall be provided behind the front wheels.

CAB MIRRORS

Two (2) Velvac "Super Star" Model 2025 chrome mirrors shall be installed, one (1) on each cab door. Each mirror shall have a 98.7 square inch flat glass viewing area and a 17.8 square inch top hat convex viewing area. Both heads shall be electrically heated and controlled by a switch on the dash convenient to the driver. The flat glass head shall be remotely controlled from the drivers seating position; the convex portion shall be manually adjustable and shall be positioned on top of the mirror assembly. Mirror housing and all mounting brackets have a bright finish.



INTERIOR CAB TRIM

The cab interior shall be constructed to create an ergonomically designed interior to be user friendly and functional for the driver and officer.

The forward overhead panel shall be covered with a one-piece custom formed ABS vinyl overlay, which shall have integrated windshield defroster/heat vents.

All ABS formed material panels, as well as all of the interior upholstery panels shall be medium gray in color. The upholstered cab overhead and side wall portions shall utilize gray Durawear upholstery with padding underneath to provide additional insulation.

The interior metal surfaces of the cab shall be finish painted with a textured gray paint.

INTERIOR REAR WALL

The interior rear wall of the cab shall be covered with gray Durawear for durability and shall match the other upholstered areas of the cab.

A twelve (12) inch high bright finish aluminum tread plate scuff plate shall be provided on the lower portion of the rear interior cab wall.

STORAGE COMPARTMENTS

There shall be a compartment provided under each front seat with a latched access door. The compartment shall measure 8-3/4"W x 7-7/8"D x 4-3/4"H.

BARYFOL FLOORING

The floor of the driver's compartment and the floor of the crew area shall be lined with BARYFOL vinyl composite flooring to comply with NFPA noise and heat requirements.

The material utilized for this application shall be certified to meet the NFPA 1901, 2009 revision for anti slip walking surfaces.

ACOUSTICAL INSULATION

One (1) inch thick acoustical insulation shall be provided on the cab roof and rear and side walls of the cab. This material shall be fitted between the cab structural members and secured with adhesive to provide an insulation barrier for noise and heat.

ENGINE ENCLOSURE

The forward portion of the engine enclosure shall be covered with a vinyl ABS material formed overlay to match the balance of the cab interior. To allow maximum "elbow room" for the driver and officer, the forward portion of the engine enclosure shall feature a contour shape. The engine enclosure shall not significantly obstruct the driver's vision in any direction. The enclosure shall be an integral part of the cab structure, which shall be constructed from .250 5052-H32 aluminum, providing adequate strength to support radio, map boxes, etc. The engine enclosure shall be insulated to protect from heat and sound. The noise insulation shall keep the DBA level within the limits stated in the current NFPA series 1900 pamphlet.

A padded, hinged access door shall be provided in the top rearward portion of the engine enclosure. The door shall allow access to the engine oil, transmission fluid, power steering fluid level dipsticks and the windshield washer fluid reservoir. The access door shall be provided with two (2) flush mounted latches and gas shock holders. There shall be a vinyl ABS material cover over the access door to give a cleaner look to the top of the engine enclosure and doghouse area.

ADDITIONAL ENGINE ENCLOSURE INSULATION

Premium soundproofing/insulation material, Barymat BTRLAX3-14BY shall be installed in the engine enclosure. To ensure a clean, smooth surface, this material shall be retained by flat aluminum panels fastened to studs that are welded to cab as needed. These panels shall be removable. Any gaps in this insulation barrier shall be sealed with 3M #425 aluminized high temperature tape.

SUN VISORS

To provide maximum protection for the driver and officer, two (2) dark smoked Lexan sun visors shall be recess mounted in the cab overhead on each side.

******* CAB SEATING & ACCESSORIES *******

DRIVER'S SEAT

The driver's seat shall be a H. O. Bostrom Sierra Air-50FX/HD air suspension, high back bucket seat. The seat shall have a tapered and padded seat cushion with lumbar support. The seat shall have a five inch fore and aft adjustment, a three inch height adjustment with heavy duty damper and a fixed seat back. The seat air ride suspension shall be pneumatically controlled from a control switch on the forward lower edge of the seat.

A red 3-point shoulder harness with lap belt shall be provided as standard equipment.

OFFICER'S SEAT

The officer's seat shall be a H. O. Bostrom Tanker 450 ABTS series fixed base high back bucket seat. The seat shall have a tapered and padded seat cushion with lumbar support. The seat shall include a SCBA storage area with integral headrest.

The seat shall be equipped with a red integrated 3-point shoulder harness with lap belt and an automatic retractor built into the seat assembly.

The officer's seat shall include a H. O. BOSTROM Secure All™ SCBA Locking System. The bracket system shall be free of straps and clamps that may interfere with auxiliary equipment on SCBA units. The center guide fork shall keep the tank in-place for a safe and comfortable fit in seat cavity. Fire fighters shall simply push the SCBA unit against the pivot arm to engage the patented auto-locking system. Once the lock is engaged, the top clamp shall surround the top of the SCBA tank for a secure fit in all directions.

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

CREW AREA SEATING, X-LFD CAB

DRIVER'S SIDE REAR FACING CREW SEAT

There shall not be a crew seat provided in the rear facing driver's side position to allow for mounting of compartments and/or other specified equipment.

OFFICER'S SIDE REAR FACING CREW SEAT

There shall not be a crew seat provided in the rear facing officer's side position to allow for mounting of compartments and/or other specified equipment.

CENTER FORWARD FACING CREW SEAT

One (1) center inboard forward facing crew seat shall be an H. O. Bostrom Tanker 450 ABTS series fixed high back bucket seat. The seat shall have a tapered and padded seat cushion with lumbar support. The seat shall include an SCBA storage area with integral headrest.

The seat shall be equipped with a red integrated 3-point shoulder harness with lap belt and an automatic retractor built into the seat assembly.

The seat base for the one (1) center inboard forward facing crew seat shall be mounted on top of the selected transverse cab compartment, measuring transverse x 15" H x 20" D. The compartment will be constructed from painted aluminum and shall be equipped with two (2) drop down access door on the front.

The center forward facing seat shall include a H. O. BOSTROM Secure All™ SCBA Locking System. The bracket system shall be free of straps and clamps that may interfere with auxiliary equipment on SCBA units. The center guide fork shall keep the tank in-place for a safe and comfortable fit in seat cavity. Fire fighters shall simply push the SCBA unit against the pivot arm to engage the patented auto-locking system. Once the lock is engaged, the top clamp shall surround the top of the SCBA tank for a secure fit in all directions.

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

SEAT UPHOLSTERY MATERIAL

The seats shall be upholstered with heavy duty gray tweed Durawear material as provided by Bostrom.

SEAT BELT CUSHION SENSORS AND BELT SENSORS

The apparatus shall be equipped with a Akron/Weldon seat belt warning system. The system shall consist of a Seat Belt module, dash mounted display and an audible alarm.

Seat belt and seat cushion sensors shall be provided on the five (5) specified seating positions.

VEHICLE DATA RECORDER

An Akron/Weldon Vehicle Data Recorder (VDR) system shall be provided. The system shall include an NFPA compliant "Black Box" with reporting software that shall be capable of data storage to coincide with the NFPA requirements.

Data storage capabilities shall include interfaces with the following systems:

- Display module (Master Optical Warning Device)
- VDR, date & time stamp
- Max Vehicle speed (MPH)
- Vehicle acceleration / deceleration (MPH/Sec.)
- Engine Speed (RPM)
- ABS event
- Data password protected
- Data sampled once per second, in 48-hour loop
- Data sampled min by min for 100 engine hours
- Throttle position (% of Throttle)
- Data software
- PC / Mac Compatible
- Data summary reports

INTERIOR CAB STORAGE COMPARTMENTS

A dual storage compartment shall be mounted in the cab in lieu of rearward facing crew seats. Each compartment shall be approximately 46" high x 24" wide x 24 deep. Each door opening shall be approximately 41 7/8 " high x 21" wide. Each compartment shall be constructed of smooth aluminum and shall be equipped with a roll-up door.

The compartments shall be constructed of aluminum and the exposed area of the comaprtment inside the cab, will be painted to match the interior surface color of the cab. The comartment shall be equipped with hinged doors with Lexan inserts for viewing compartment interior.

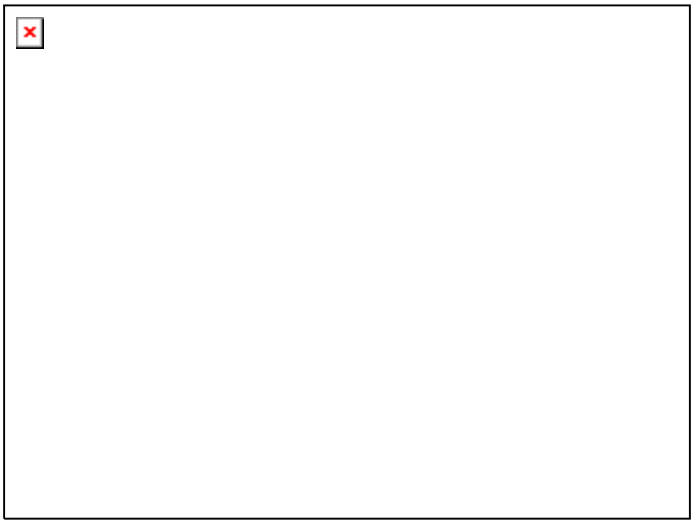
The EMS compartment shall be equipped with one (1) Weldon model #2630 halogen interior light(s). The light(s) shall be wired to automatically activate when the compartment door is open and the master battery switch is in the "on" position.

CAB DOGHOUSE STORAGE MODULE

A storage module shall be installed on the center doghouse area between the driver and officer. The module shall be constructed of 1/8" aluminum and shall be painted with a scuff resistant paint to match the cab interior. The module shall include two (2) cup holders, a pen tray, a flat open storage area for notebooks, six (6) divided storage area's for 3-ring binders, and four (4) slide in storage area's two (2) accessible from each side of the cab.

INTERIOR COMPARTMENT CAB

One (1) fully enclosed, full width compartment approximately 10" deep x 8" high mounted to the cab ceiling at the rear wall. Compartment made of 1/8" aluminum with two (2) aluminum hinged doors with latch and gas spring stay arm. Doors to be of equal size and hinged at top. Bottom front edge to have a padded vinyl covered bumper to match cab interior.



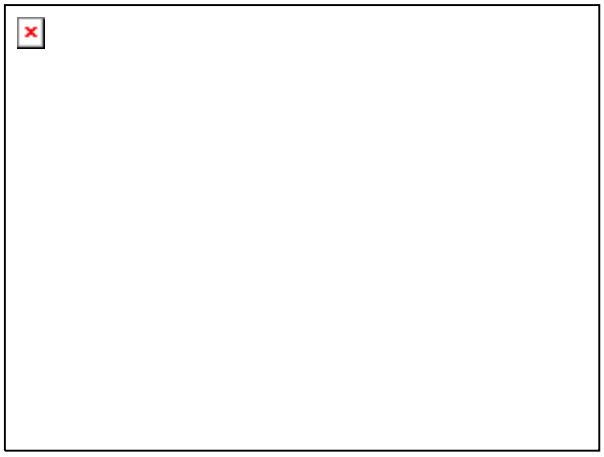
ANTENNA INSTALLATION

Two (2) antenna mounting base(s) model #MATM with 17' of coaxial cable shall be provided and installed on the lower cab roof, behind the light bar. The attached antenna wire(s) shall be run to the right side cab dash area.

The Fire Department is responsible to have the correct antenna whip installed once the apparatus is delivered.

LAPTOP COMPUTER SLIDE OUT TRAY

A slide out tray shall be installed for the officer to provide an area for laptop computer usage. In the closed position this area will be nest forward to allow access in and out of the vehicle.



****** COMMAND CAB ACCESSORIES & OPTIONS ******

Interior Cabinet:

An interior cabinet shall be fabricated and installed horizontally between the two rear facing EMS Cabinets. This cabinet shall be the same depth as the EMS cabinets and measure approximately 24" tall. A door with laexan insert shall be horizontally hinged as directed at pre-build.

******* CAB INSTRUMENTATION & CONTROLS *******

DASH & CENTER CONSOLE

The dash shall be constructed of a vinyl overlaid, ABS custom formed material to create an ergonomically designed interior to be user friendly and functional for the driver and officer. The instrument cluster shall be centered in front of the driver and all gauges shall be fitted in a non-glare pewter panel.

All warning lights and indicators shall be located in either the gauge itself or in the warning light cluster located in the lower center portion of the dash. Each gauge shall be equipped with an international symbol that is easily recognizable, denoting the system being monitored. Instrumentation shall be backlit for easy identification.

The transmission gear selector and the spring brake control valve shall be located on the left side of the center dash assembly, toward the driver for easy access.

There shall be provisions for mounting a switch panel in the center of the dash between the driver and officer. The top center of the dash assembly shall contain one (1) large removable access door for access to the main chassis wiring panels and breaker panels.

DRIVERS DASHBOARD PANEL

The main instrument panel shall be centered in front of the driver and shall be hinged at the bottom with two ¼ turn latches at the top. The dash panel shall be 1/8" aluminum with an anti-glare, pewter finish brushed surface. The drivers dashboard panel shall contain the gauge panel along with an instrument warning light cluster.

The main instrument panel shall contain ten (10) primary gauges. An ignition and engine start switch shall be located on a panel to the left upper portion of the driver's side dash panel.

Each gauge shall have a raised glass lens with polished chrome trim ring and be backlit by integral blue LED's. Each gauge shall be designed with an integral red warning light with a pre-programmed warning point. Gauges monitoring drive-train component status shall be of the direct data bus type capable of displaying information broadcast on the J 1939 data-link. Each gauge warning indicator shall be capable of activating an audible alarm inside the dashboard.

Additional auxiliary control switches and instruments (if applicable) shall be located within the center or overhead panel located near the driver's position.

The ten (10) primary gauges shall consist of:

- Vehicle speedometer (0-80 mph)
- Engine tachometer (0-3000 rpm)
- Engine oil pressure (0-100 psi); low oil pressure warning
- Engine coolant temperature (100-280 °F); high engine temp warning

- Transmission oil temperature (100-350 °F); high transmission fluid temp warning
- Vehicle battery voltage (9-18 VDC); low voltage warning at
- Front air system gauge (0-150 psi); low air pressure warning at 65 psi
- Rear air system gauge (0-150 psi); low air pressure warning at 65 psi
- Fuel level (E-1/2-F); low fuel level warning
- Air cleaner restriction gauge (0 - 40), warning at 25"

Secondary fuel primer control switch

Engine Compression Brake Controls

A Vista display shall be provided between the driver and officer for the electrical V-MUX multiplex system. The exact location shall determined by the totality of instruments and switches on the cab dash. The display shall be in easy reach of the officer to view information.

INDICATOR CLUSTER

The driver's dashboard panel shall consist of Ametek gauges, an 18 item instrument warning light cluster and a 16 item, dead front type alarm panel.

This display shall contain the system control unit that collects data from the vehicle data bus (J1939), analog sensors, and switches throughout the vehicle. This data shall be presented using gauges, telltales and the two (2) display panels. The warning light display shall include a 2 x 20 dot matrix display, 18 telltales and 2 buttons to navigate through the screen menus.

The LCD dot matrix display shall be a 2 line by 20-character display with each character being 7 dot by 5 dot configuration. FSTN technology shall be used on the display for wide viewing capability. The module shall be backlit with amber LED's. The unit shall also be supplied with a heater to ensure proper operation over the entire 40 to +85 deg. C.

This display contains a series of two (2) screens to provide information about the vehicle. To control the display of that information, the screens are divided into two (2) menus; one that can be displayed while the vehicle is in motion and one that can only be accessed when the parking brake is set.

On the Road displays include:

- Two (2) configurable displays that can show any of the parameters the unit collects. This includes odometer, trip information, fuel economy information; all gauge data, and virtually any other data available on the vehicle that the display has access to, either through the data bus or via analog inputs.
- Two (2) trip displays for miles and hours that are capable of being reset.
- Two (2) fuel data screens: shall be provided; one for fuel remaining until empty and one for fuel economy. The fuel economy display shall be capable of being reset so that average economy over a predetermined period can be displayed.

The displays that can be accessed when the parking brake is set include:

- Engine hours as maintained by the engine ECU
- Service Alarm screens to report miles to next service or miles past required service. These screens shall allow the operator to choose the length of the service interval and shall have the ability to reset it.
- Message screens with warning messages the display has collected during the current ignition

cycle. These screens shall be divided into configured warnings such as “Low Air Pressure” and the data bus faults reported by ECU's on the vehicle. Both lists shall allow the operator to review the last 12 events that occurred on the vehicle for maintenance and troubleshooting purposes.

- Diagnostic screens shall test the instrumentation system to verify it is working correctly.
- Setup screens shall be used to select either English or metric display. They shall also allow the operator to choose the data that shall be displayed by the configurable on-the-road screens.

The system shall be configured with user defined warning messages such as Low Air Pressure or High Coolant Temperature. When these events occur the warning message shall come up on the screen and can be accompanied by a buzzer. The messages shall be prioritized so the most important messages are always displayed. Whether the message can be dismissed by pressing a button shall be configurable. Messages that have been dismissed but are still active shall be retained in the message screens for review until the ignition is turned off. Listed below are the defined telltales and their indicators.

- "Right And Left Directional" arrows (green in color)
- "Ignition ON" Indicator (amber in color)
- "Hi Beam" indicator (blue in color)
- "Battery ON" indicator (green in color)
- "Parking Brake ON" indicator (red in color)
- "Check Transmission" indicator (amber in color)
- "Cab Not Latched" indicator (red in color)
- "Stop Engine" indicator (red in color)
- "Check Engine" indicator (amber in color)
- "ABS Warning" indicator (red in color)
- "Low Coolant Level" (red in color)
- "Fuel Restriction" indicator (amber in color)
- "Water In Fuel" indicator (amber in color)
- "Fasten Seat Belts" indicator (red in color)
- "Fast Idle" Indicator (amber in color)
- "Do Not Move Truck" indicator (red in color)
- "DPF Regeneration" (amber in color)
- "Exhaust High Temperature" (amber in color)
- "Engine Diagnostic Fault" (amber in color)
- "Retarder On" (green in color)

Listed below are indicators that may be included, depending upon the vehicle configuration:

- "Wait To Start" indicator (amber in color)
- "Exhaust System Fault" (amber in color)
- "Topps System Fault" (amber in color)
- "Lube System Active" (amber in color)
- "Jacks Not Stowed" (red in color)
- "PTO Engaged" (green in color)
- "Inter Axle Lock" (amber in color)
- "4x4" (green in color)
- "Driver Controlled Diff Lock" (green in color)

- "Ok to Pump" (green in color)
- "Auto Traction Control" (amber in color)
- "Retarder Active" (amber in color)
- "Auxiliary Brake Active" (amber in color)

"Low Engine Coolant" indicator light and alarm

LOWER RIGHT AUXILIARY SWITCH PANEL

The driver's lower right panel shall be capable of housing five (5) guarded type rocker switches. Examples of the switches that shall be installed in this area are automatic chains, fan clutch over-ride, ATC, inter-axle diff lock, electric fuel pump, all wheel drive, etc.

PUMP SHIFT CONTROL

The pump shift control and pump engaged indicator light shall be mounted in the driver's lower left panel. This control shall be equipped with a mechanical type lock to prevent inadvertent activation or de-activation. The lever positions and indicator light shall be clearly marked.

OFFICER DASH

There shall be a flat surface area in front of the officer.

CENTER OVERHEAD PANEL

An overhead console with a removable pewter panel shall be provided on the cab roof between the driver and officer to permit installation of cab stereo, intercom systems, arrow stick controls, etc. The overhead console shall be approximately 27" wide x 4" high x 13" deep and shall be painted to match the interior of the cab. The overhead console shall not obstruct the driver's vision through the officer's side window.

CLIMATE CONTROL SYSTEM

A climate-control system shall be provided for total cab environmental comfort. This system shall provide heat, cooling and defrost capabilities to various areas in the cab. The system shall consist of two (2) evaporator units, mounted in the center overhead of the cab. One (1) unit shall provide defrost, air conditioning and heat for the front of the cab and shall provide heating and cooling for the drivers and officers feet. One (1) unit shall provide heat and air conditioning for the back of the cab.

The ceiling mounted evaporator/heater unit for the front shall include the following:

- Dual high output blower.
- High efficiency coil that includes "rifled" tubing and oversized header tubes for maximum refrigerant distribution.
- Four (4) 3" diameter, adjustable louvers; two (2) each side of the cab overhead, facing the driver and officer seat positions.
- Four (4) 3" diameter, adjustable defroster louvers positioned above the windshield to provide optimum coverage.
- Four (4) 3" diameter adjustable louvers, one (1) below the driver and officer seat positions and one (1) under each outboard rear facing crew seat.
- Damper controls shall be pneumatically operated to provide air discharge to the windshield, front overhead air discharge louvers or floor position as required and shall be located above the driver

seat position.

- An electric water valve to control the amount of heat.
- Fully insulated housing.
- BTU: 34,000 A/C
- BTU: 50,000 Heat
- CFM: 410 @ 13.8 volts

The ceiling mounted evaporator/heater unit for the crew area shall include the following:

- Dual high output blower
- High efficiency coil which includes, "rifled" tubing and oversized header tubes for maximum refrigerant distribution
- Eight (8) 3" diameter, adjustable louvers positioned to provide optimum coverage.
- Fully insulated housing.
- BTU: 36,400 A/C
- BTU: 52,000 Heat
- CFM: 440 @ 13.8 volts

ROOF MOUNT CONDENSER

A 12-volt roof top condenser shall be strategically positioned on the cab roof so as not to interfere with any emergency lighting systems and shall include the following:

- High performance, long life fan assemblies. Fan motors are sealed around housing and shaft areas.
- Condenser and coil design includes rifled tubing for maximum efficiency. Coil is painted black.
- Condenser unit includes receiver drier with hi/lo pressure switch.
- Wire harness includes necessary wiring for clutch circuit as well as a separate power relay circuit.
- 14 gauge mounting brackets
- 16-gauge condenser frame and fan shroud
- 16 gauge aluminum cover, E-coated white

Mounting design will enable easy servicing of all components and unit replacement if necessary.

The ceiling mounted evaporator unit shall be covered with an ergonomically designed custom ABS panel to provide maximum headroom and a pleasing appearance.

The roof mounted air conditioning condenser housing(s) shall be painted to match the cab roof color.

CLIMATE CONTROL SWITCHES

The drivers overhead panel shall contain all controls for the cab climate control system. The following controls shall be provided: mode selector switch, front fan speed switch, rear fan speed switch, air conditioning on/off switch, and temperature control dial. All controls shall be clearly labeled, adequately backlit, and installed in an easily removable panel.

CAB TILT ASSEMBLY

The cab tilt mechanism shall be custom designed for ease of maintenance and shall consist of two (2) hydraulic cylinders with a maximum lift capacity of 19,625 pounds. Hydraulic lines shall be rated at

at 20,000 PSI burst pressure. Each cylinder shall have an attached hydraulic locking mechanism, in the event of a hydraulic failure. Hydraulic cylinders shall be detachable to allow removal of the engine for major service. A mechanical cylinder stay bar and release shall be provided to insure a positive lock in the tilted position.

The two (2) rear outboard cab latches shall be of the hydraulic pressure release, automatic re-latching type, and provide an automatic positive lock when the cab is lowered. The latch must not disengage or experience any damage when subjected to a pull apart tensile load of 6,000 lbs. The hydraulic pressure required to unlock the latch shall not exceed 550 PSI. The latch shall withstand 5,000 PSI without leaks or damage and withstand 1,000 continuous cycles of operation under a load of 1,000 lbs at liftoff. The tilt pump shall be electric over hydraulic type, with a pressure rating of not less than 4,000 PSI. Additionally, the cab tilt device shall be both electrically and hydraulically interlocked to prevent inadvertent activation of the cab tilt system.

- A "CAB NOT LATCHED" indicator shall be provided in the cab dash-warning cluster.
- A dual switch control system shall be provided for the cab tilt, located on the passenger side pump panel. System shall consist of a three (3) position toggle switch along with a rubber covered push button switch.

AUDIBLE ALARM (CAB TILT)

An audible alarm shall be provided to alert the operator when the cab is being raised or lowered.

The cab tilt control shall be equipped with an interlock that shall disable the cab tilt system , in the event the parking brake is not applied.

CHASSIS FRAME ASSEMBLY

The chassis frame shall be fabricated in its entirety in the factory of the apparatus manufacturer. This shall prevent any split responsibility in warranty or service.

The frame shall consist of two (2) channels fastened together by cross members. All structural fasteners used in the frame shall be Grade 8 hardware. Hardened steel washers shall be used under all bolt heads and nuts to avoid stress concentrations. Top flange shall be free of bolt heads. All spring hangers shall be machined steel castings. Weldment type chassis and the use of Huck bolts shall not be acceptable.

Each main frame rail shall be 10-1/4" x 4" x 3/8", fabricated from 110,000 PSI minimum yield steel, with a minimum section modulus of 17.97 in 4 and a resisting bending moment (RBM) of 1,976,700 inch pounds.

A full length inner frame liner shall be installed. Total section modulus of each rail, with liner, shall be 31.20 in 4 and the total resisting bending moment (RBM) shall be a minimum of 3,432,000 in-lbs, per rail.

Formed frame rails or a fish plated frame shall not be acceptable.

The chassis frame assembly, consisting of frame rails, cross members, axles and steering gear(s), shall be finish painted before installation of any electrical wiring, fuel system components, or air system components. All components or brackets fastened to the frame rails shall be cleaned, primed and painted prior to being attached to the frame rails.

***** FRONT BUMPER, EXTENSION & ACCESSORIES *****

FRONT BUMPER

A 12" high, 101" wide, two (2) ribbed, bright finish stainless steel front bumper shall be provided. The bumper shall be a wrapped design to match the contour of the front cab sheet.

The bumper shall be extended 20" with a polished aluminum tread plate gravel shield enclosing the top and ends.

CORNERING LIGHTS

A pair of Whelen #5VC03ZCR LED lights shall be provided and shall be mounted vertically, (1) one each side of the custom chassis front bumper, in a Whelen #5TSMAC chrome plated flange. The lights shall be wired to activate with the turn signals .

TOW HOOKS

Two (2) front painted tow hooks shall be fastened directly to the frame, below the front bumper. The tow hooks shall be fastened with grade 8 bolts and nuts.

FRONT AXLE

Front axle shall be a Meritor MFS-20-133 A-N, reversed Elliott "I" beam type and include low friction "Easy Steer" bushing technology for maximum steering ease and longer life.

The front axle shall be rated at 20,000 lbs. (Minimum)

FRONT DISC BRAKES

Meritor EX-225 H, 17" disc brakes shall be provided for the front axle. The front brakes will be full air actuated with automatic slack adjustment.

FRONT SUSPENSION

Front suspension shall be progressive rate front leaf springs. The spring shall be permanently pinned at the front and have a shackle double pinned mounting at the rear. Suspensions allowing the spring to float freely at the ends without a permanent pin shall not be acceptable.

The front leaf springs shall have a minimum of 9 leaves, a minimum length of 51", and a minimum width of 3-1/2". The capacity at ground shall be 20,000 lbs., or exceed the capacity of the axle, unless specified to the contrary in this specification. All springs shall be of center bolt design. Cup center springs shall not be acceptable. All springs shall be positively restrained from rotating in brackets and shackles.

FRONT SHOCK ABSORBERS

The front suspension system shall be equipped with Monroe, model "Magnum - 70", double acting hydraulic shock absorbers. Shock absorbers to have a minimum bore of 1.38" and an outside diameter of approximately 3-1/4".

REAR AXLE

Rear axle shall be a single, Meritor RS-30-185 with a capacity of 31,000 lbs. (Minimum). Axle

shall be a single reduction axle with hypoid gearing and oil-lubricated wheels bearing. Oil seals shall be provided as standard equipment.

REAR BRAKES

Brakes shall be "S" Cam, 16-1/2" x 7" size and shall be full air actuated with automatic slack adjusters.

REAR AXLE TOP SPEED

The rear axle/s shall be geared for a vehicle top speed in accordance with NFPA sections 4.15.2 and 4.15.3.

Units with GVWR over 26,000 pounds shall be limited to 68 mph. If the combined tank capacity is over 1250 gallons of foam and water or the GVWR is over 50,000 pounds, the vehicle top speed shall be limited to 60 mph or the fire service rating of the tires, whichever is lower.

REAR SUSPENSION

The rear suspension shall be leaf type, variable rate with a 31,000 lb. rating. The main spring assembly shall consist of 11 leaves with the main spring measuring 60.5" L x 3" W.

There shall be a rubber block helper mounted above the leaf springs, rated at 4,500 lbs. Two (2) fully wrapped leaves shall transmit driving and braking torque. The rating shall be designed to match or exceed the rear axle. Designs allowing the main pack to float are not acceptable.

******* AIR & BRAKE SYSTEM *******

BRAKE SYSTEM

A dual circuit, air operated braking system, meeting the design and performance requirements of FMVSS -121 and the operating test requirements of NFPA 1901 current edition shall be installed. It shall be direct air type with dual air treadle in the cab. The system shall be powered by an engine mounted, gear driven air compressor protected by a heated air dryer.

The air system shall be plumbed with reinforced, air brake tubing/hose in conformance to SAE J 844-94, Type B and U.S.D.O.T. standards. The compressor discharge shall be plumbed with stainless steel braided hose lines with a Teflon lining. Eaton Synflex Eclipse Air Brake tubing shall be run along the inside frame rails and connected with Eaton Q-CAB 217 series fittings that meet or exceed all industry standards. All Synflex tubing shall be secured with non-conductive, corrosion resistant strapping mounted with standoff fasteners. Cord reinforced rubber hose lines with brass fittings shall be installed from the frame rails to axle mounted air connections.

The air system shall provide a rapid air build-up feature and low-pressure protection valve with light and buzzer, designed to meet the requirements of NFPA 1901, current

ABS SYSTEM

An Anti-Skid Braking System (ABS) shall be provided to improve braking control and reduce stopping distance. This braking system shall be fitted to all of the axles. All electrical connections shall be environmentally sealed, water, weatherproof, and vibration resistant.

The system shall constantly monitor wheel behavior during braking. Sensors on each wheel shall transmit wheel speed data to an electronic processor which shall sense approaching wheel lock causing instant brake pressure modulation up to 5 times per second in order to prevent wheel lockup. Each wheel

Each wheel shall be individually controlled.

To improve service trouble shooting, provisions in the system for an optional diagnostic tester shall be provided. The system shall test itself each time the vehicle is started. A dash-mounted light shall go out once the vehicle has attained 4 mph after successful ABS start-up To improve field performance, the system shall be equipped with a dual circuit design. The system circuits shall be configured in a diagonal pattern. Should a malfunction occur, the defective circuit shall revert to normal braking action. A warning light shall signal malfunction to the operator. The system shall consist of a wheel mounted toothed ring, sensor, sensor clip, electronic control unit and solenoid control valve.

The sensor clip shall hold the sensor in close proximity to the toothed ring. An inductive sensor consisting of a permanent magnet with a round pole pin and coil shall produce an alternating current with a frequency proportional to wheel speed. The unit shall be sealed, corrosion resistant and protected from electromagnetic interference. The electronic control unit shall monitor the speed of each wheel. A deviation shall be corrected by cyclical brake application and release. If a malfunction occurs, the defective circuit shall signal the operator and the malfunctioning portion of the system shall shut down. The system shall be installed in a diagonal pattern for side-to-side control. The system shall insure that each wheel is braking to optimum efficiency up to 5 times a second.

The system shall also control application of the auxiliary engine exhaust or drive line brakes to prevent wheel lock.

This system shall have a three (3) year or 300,000 mile parts and labor warranty as provided by Meritor Wabco Vehicle Control Systems.

BRAKE AIR RESERVOIRS

There shall be a minimum of three (3) air reservoirs installed in conformance with best automotive practices. Reservoir capacity total shall be a minimum of 4400 cubic inches.

The air reservoirs shall be color coded to match the air lines for easy identification, ease of maintenance and troubleshooting. The reservoirs shall be painted the following colors:

- Wet Tank Black
- Primary Tank Green
- Secondary Tank Blue
- Auxiliary Tank(s) Yellow

Each additional air tank shall be equipped with an automatic moisture ejector.

For ease of daily maintenance, each air system reservoir shall be equipped with a brass 1/4 turn drain valve.

AIR DRYER

A Bendix #AD-9 heated air dryer shall be furnished. An automatic moisture ejector on the primary, or wet tank, shall also be furnished

AIR LINES

The entire chassis air system shall be plumbed utilizing reinforced, Synflex air lines. All of the airlines shall be color coded to correspond with an air system schematic and shall be adequately protected from heat and chafing.

AIR COMPRESSOR

Air compressor shall be a Wabco brand, minimum of 18.7 cubic feet per minute capacity. Air brake system shall be the quick build up type. The air compressor discharge line shall be stainless steel braid reinforced Teflon hose.

A pressure protection valve shall be installed to prevent the use of air horns or other air operated devices should the air system pressure drop below 80 psi (552 kPa).

The chassis air system shall meet NFPA 1901, latest edition for rapid air pressure build-up within sixty (60) seconds from a completely discharged air system. This system shall provide sufficient air pressure so that the apparatus has no brake drag and is able to stop under the intended operating conditions following the sixty (60) seconds build-up time.

BRAKE TREADLE VALVE

A Bendix dual brake treadle valve shall be mounted on the floor in front of the driver. The brake control shall be positioned to provide unobstructed access and comfort for the driver.

PARKING BRAKE

Parking brake shall be of the spring-actuated type, mounted on the rear axle brake chambers. The parking brake control shall be mounted on the cab center instrument panel, offset toward the driver. A red indicator light shall be provided in the driver dash panel that shall illuminate when the parking brake is applied.

AUXILIARY AIR INLET

A quick disconnect male auxiliary air inlet shall be provided at the driver's side door area at a location to be determined at a pre-construction conference. A mating female quick disconnect female connector shall be shipped loose with the apparatus. This shall allow a Purchaser furnished external air supply to be connected to the chassis air system.

AIR SUPPLY HOSE

A 50' section of air supply hose shall be provided with the vehicle to allow the fire department to utilize the air discharge on the cab. The hose shall be provided with a male and female coupling that shall match the coupling on the cab.

AUXILIARY AIR INLET/AUTO EJECT

A Kussmaul Auto Air Eject #091-28 inlet shall be provided on the driver side of the cab, exact location to be determined at a later date. The Air Eject shall be mounted using a Kussmaul Weatherproof Adapter Kit #091-28AK.

The Kussmaul air-eject connection shall be equipped with a Red weatherproof cover.

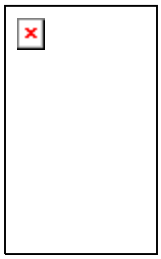
The air eject shall be located in the area directly adjacent to the driver's side cab door, above the side air grille.

FRONT WHEELS & TIRES

The front wheels shall be 22.5" x 12.25" ten stud, hub piloted, DuraBright aluminum disc type.

The aluminum disc front wheels shall be provided with bright nut covers and hub caps.

The front tires shall be Michelin 425/65R22.5 "20 Ply" tubeless radial XZY3 wide base mixed tread. The tires shall be fire service rated up to 24,400 lbs and shall have a top speed of 65 mph when inflated to 120 psi.



Fire Service Rating means operations not to exceed one hour loaded travel at maximum speed, with at least a one hour cool down prior to another loaded run.

Industry load and inflation standards are in a constant state of change. Printed material may not reflect the latest load and inflation standards.

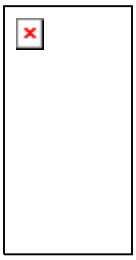
NOTE : NEVER EXCEED THE MAXIMUM AIR PRESSURE LIMITATION

REAR WHEELS & TIRES

The single rear axle wheels shall be 22.5" x 9" ten stud, hub piloted, DuraBright aluminum disc type.

The single rear axle aluminum disc wheels shall be provided with bright nut covers and hub caps.

The rear tires shall be Michelin 315/80R22.5 "20 Ply" tubeless radial XDY3 traction tread. The tires shall be fire service rated up to 35,000lbs and shall have a top speed of 65 mph when inflated to 130 psi.



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NOTE : NEVER EXCEED THE MAXIMUM AIR PRESSURE LIMITATION

TIRE PRESSURE MONITORING DEVICES

Each tire shall be equipped with an air pressure indicator cap on the valve stem. Each cap shall have a visual indicator to show if the tire is correctly inflated.

******* ENGINE, TRANSMISSION & ACCESSORIES *******

ENGINE

Engine shall be a Cummins, Model ISM 500, diesel, turbo-charged, per the following specifications.

- Max. Horsepower 500 HP @ 1900 RPM
- Governed Speed 2100 RPM
- Peak Torque 1550 lb. ft. @ 1200 RPM
- Cylinders Six (6)
- Operating Cycles Four (4)
- Bore & Stroke 4. 9 x 5.8 in.
- Displacement 661 cu. in.
- Compression Ratio 16.1:1
- Governor Type Limiting Speed
- Drive line Size 1810 Series

Engine oil filters shall be engine manufacturers branded or approved equal. Engine oil filters shall be accessible for ease of service and replacement.

A fuel/water separator shall be provided.

The manufacturer shall be able to furnish proof of engine installation approval by the engine manufacturer.

ENGINE WARRANTY

The Cummins engine shall be warranted for a period of five (5) years or 100,000 miles, whichever occurs first.

COOLING/RADIATOR

Radiator shall be brass with bolted steel top and bottom tanks. The cooling system shall be designed for a maximum of fifteen (15) PSI operation. There shall be a sight glass in the radiator to check the coolant level without removing the radiator cap. The core construction shall be tube and fin with three (3) tube rows, 273 total core tubes, and fourteen (14) fins per inch.

Extended life engine coolant shall provide anti-freeze protection to -30° F. The mixture shall be per the engine manufacture's specifications.

A transmission oil to liquid cooler shall be furnished.

Core area shall be a minimum of 1375 square inches (39 H x 35.25W).

RADIATOR SKID PLATE

The radiator installation shall include a heavy-duty radiator skid plate to protect the radiator from debris or obstructions under the chassis. The skid plate shall be designed so the angle of approach is not affected.

CHARGE AIR COOLER

The charge air cooler shall be constructed of aluminum with cast aluminum side tanks. The cooler shall have a frontal core size of 957 square inches, seven (7) fins per inch, and forty eight (48) core tubes.

The charge air cooler shall be mounted directly ahead of the radiator and to the radiator headers. Rubber isolators shall be used at the mounting points to reduce transmission of vibrations.

The piping between the charge air cooler and engine shall use heavy duty hoses with stainless steel bands. Bands are used to maintain the shape of the hose during changing turbo boost pressures. The hoses shall be attached with stainless steel constant torque hose clamps.

COOLING SYSTEM FAN

The engine cooling system shall incorporate a heavy duty fan, installed on the engine and include a shroud.

The fan shall be equipped with an air operated clutch fan, which shall activate at a pre-determined temperature range.

Re-circulation shields shall be installed to ensure that air which has passed through the radiator is not drawn through it again.

Heavy duty silicone heater and coolant hoses shall be furnished for the heater and coolant system. All coolant hoses shall be equipped with constant torque type hose clamps. All integral hoses supplied with the engine shall be as supplied by the engine manufacturer.

LOW COOLANT INDICATOR LIGHT AND ALARM

A low engine coolant indicator light located in the dash instrument panel shall be provided. An audible alarm shall be provided to warn of the low coolant condition.

ENGINE BRAKE

An engine compression brake shall be furnished for increased braking capabilities. Controls shall be as provided by the engine manufacturer and shall be activated by releasing the throttle pedal to the idle position.

The engine compression brake shall have dash mounted control switches to turn the brake on or off as well as to control the operational level of the brake.

The engine brake shall be wired in such a manner so as to illuminate the chassis brake lights when the engine brake is engaged and operating.

The engine brake shall be interlocked with the PTO operation and shall automatically disengage any time the apparatus is operating with the PTO active.

ENGINE FAST IDLE

A fast idle for the electronic controlled engine shall be provided. The fast idle shall be controlled by an ON/OFF switch on the dash.

An electronic interlock system shall prevent the fast idle from operating unless the transmission is in "Neutral" (or "Park" if so equipped) and the parking brake is fully engaged. If the fast idle control is used in conjunction with a specified engine/transmission driven component or accessory, the fast idle control shall be properly interlocked with the engagement of the specified component or accessory.

AIR CLEANER

An engine air cleaner shall be provided. Air cleaner shall include a dry type element. Air cleaner shall be installed in accordance with the engine manufacturer's recommendations. The air cleaner shall be located to the rear of the engine, with streamline air pipes and hump hose connections from the inlet to the air cleaner and from the air cleaner to the turbo. The air cleaner shall be easily accessible when the cab is tilted.

Air cleaners mounted on the side or near the bottom of the cab shall not be acceptable. [NO EXCEPTIONS]

SPARK ARRESTOR

A spark arrestor shall be installed in the chassis air intake system. This arrestor shall be mounted behind the intake grille to filter out airborne embers. The spark arrestor housing must be easily accessible when the cab is tilted.

ACCELERATOR CONTROL

A floor mount accelerator pedal shall be installed on the floor in front of the driver. The pedal shall be positioned for comfort with ample space for fire boots and adequate clearance from the brake pedal control.

TRANSMISSION

An Allison World Transmission, Model 4000 EVS electronically controlled, automatic transmission shall be provided. Transmission specifications shall be as follows:

- Max. Gross Input Power 600 HP
- Max. Gross Input Torque 1850 lb. ft.
- Input Speed (Range) 1700- 2300 RPM
- Shift Calibrations 5 Speed (6th not avail. for fire appl.)
- Direct Gear (Pumping) 4th (Lock-up)
- Direct Gear Ratio 1.00:1
- Overdrive Ratio 0.74:1

Transmission installation shall be in accordance with the transmission manufacturer's specification. The transmission shall be readily and easily removable for repairs or replacement.

An illuminated, touch-pad type shift control shall be mounted in the cab, convenient to the driver. Shift control shall be approved by the transmission manufacturer.

TRANSMISSION OIL LEVEL SENSOR

The transmission shall be equipped with the oil level sensor (OLS); this sensor shall allow the operator to obtain an indication of the fluid level from the shift selector. The sensor display shall provide the following checks, correct fluid level, low fluid level and high fluid level.

PARK TO NEUTRAL

The transmission, upon application of the parking brake, shall automatically shift into neutral.

TRANSMISSION FLUID

TES-389 transmission fluid shall be utilized to fill the 3000 EVS transmission.

DRIVE LINES

Drive lines shall be Dana (Spicer) 1810 heavy duty series or equal, with "glide coat" splines on all slip shafts. The chassis manufacturer shall utilize an electronic type balancing machine to statically and dynamically balance all drive shafts. The chassis manufacturer shall be able to provide proof of compliance with all drive shaft manufacturer's standards and specifications. (No Exceptions)

EXHAUST SYSTEM

The exhaust system shall be installed in accordance with the engine manufacturer's requirements and meet all Cummins Non - DPF system requirements and State noise level requirements. Exhaust system components shall be securely mounted and easily removable.

The muffler shall be sized to be compatible with the engine exhaust discharge.

Exhaust tubing shall be a minimum of 16 gauge material. Any flexible exhaust tubing shall be HDT stainless steel type. To minimize heat build-up, exhaust tubing within the engine compartment shall be wrapped with an insulating material. Exhaust shall be wrapped from the turbocharger to the entrance of the muffler. Material shall be held in place with worm gear type clamps.

The exhaust tailpipe extending from the muffler (DPF) to the side of the vehicle shall be constructed from 16-gauge aluminized steel tubing. The exhaust discharge shall be on the officer side of the apparatus forward of the rear axle.

****** FUEL SYSTEM ******

FUEL TANK

Fuel tank shall be a minimum of fifty (50) gallon capacity. It shall have a minimum fuel filler neck of 2" ID. A 1/2" minimum diameter drain plug shall be provided. The tank shall be fabricated from stainless steel. Provisions for an additional feed line and fuel level float shall be provided for apparatus manufacturer's use.

The fuel tank shall be installed behind the rear wheels between the frame rails.

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

FUEL TANK STRAPS

The straps supporting the diesel fuel tank shall be made of Type 304L stainless steel with stainless steel hardware. NO EXCEPTION.

The fuel lines shall be ParaFlex HTFL fuel hose. The lines shall be carefully routed and secured along the inside of the frame rails.

FUEL FILTER/WATER SEPARATOR

A Racor heated fuel filter/water separator shall be provided in the fuel system. A "water in fuel" indicator shall be provided on the dash.

SECONDARY ELECTRIC FUEL PUMP

In addition to the primary fuel pump, a secondary electric fuel pump for re-priming shall be furnished in the main fuel line. A labeled control switch shall be provided on the main dash panel.

SECONDARY ELECTRIC FUEL PUMP

In addition to the primary fuel pump, a secondary electric fuel pump for re-priming shall be furnished in the main fuel line. A labeled control switch shall be provided on the main dash panel.

FUEL POCKET

A fuel fill shall be provided in the left side rear wheel well area. A Cast Products heavy duty cast aluminum spring loaded hinged fill door shall be provided.

A label indicating "Ultra Low Sulfur Diesel Fuel Only" shall be provided adjacent to the fuel fill.

A polished stainless steel trim panel shall be provided around the fuel fill door on the side of the

body panel.

DUAL POWER STEERING

A dual power steering system shall be provided utilizing a Sheppard model #M110 main steering gear on the driver side of the chassis and a Sheppard model #M90 assist steering gear on the officer side of the chassis.

The power steering gear on the officer side of the chassis will increase performance in turning the officer side wheel assembly, reducing loads and forces on the main gear and components.

The steering system shall be designed to maximize the turning capabilities of the front axle no matter the rating and tire size. The use of a power assist cylinder on the officer side of the chassis is NOT ACCEPTABLE.

The system shall be designed utilizing an engine driven hydraulic pump, with a maximum operating pressure of 2000 PSI. Steering design shall permit a maximum of 5.6 turns from stop to stop. Steering system components shall be mounted in accordance with the steering gear manufacturer's instructions.

STEERING WHEEL & COLUMN

The steering wheel shall be vinyl padded, minimum 18" diameter, with a center hub mounted horn button. There shall be a self-canceling, directional signal lever and a traffic hazard switch on the steering column. The high beam activator shall be controlled by pulling the directional signal lever toward the driver.

The steering column shall have a separate lever control for tilting and telescoping capability.

ROAD SAFETY KIT

A road safety kit shall be furnished with the following equipment:

- 2 1/2 lb. B-C fire extinguisher
- Triangle safety reflectors

******* CHASSIS/BODY ELECTRICAL & ACCESSORIES *******

CHASSIS ELECTRICAL SYSTEM

All electrical wiring in the chassis shall be SXL cross link insulated type. Wiring is to be color coded and include function codes every three (3) inches on both sides. Wiring harnesses shall be routed in protective, heat resistant loom, securely and neatly installed. Two (2) power distribution centers shall be provided in central locations for greater accessibility. The power distribution centers shall contain automatic thermal self resetting breakers, power control relays, flashers, diode modules, daytime driving light module, and engine and transmission data links. All breakers and relays shall have a capacity substantially greater than the expected load on the related circuit, thus ensuring long component life. Power distribution centers shall be composed of a system of interlocking plastic modules for ease of custom construction.

The power distribution centers shall be function oriented. The first is to control major truck function. The second control center shall enable overhead switching and interior operations. Each module shall be single function coded and labeled to aid in troubleshooting. The centers shall also have accessory breakers and relays for future installations. All harnesses and power distribution centers shall be electrically tested prior to installation to ensure the highest system reliability.

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

WIRING HARNESS DESCRIPTION

The wiring harness contained on the chassis shall be designed to utilize wires of stranded copper or copper alloy of a gauge rated to carry 125% of maximum current for which the circuit is protected without exceeding 10% voltage drop across the circuit. Wiring must be uniquely identified by color code or circuit function code, labeled at a minimum of every three (3) inches. The identification of the wiring shall be referenced on a wiring diagram. All wires conform to SAEJ1127 (Battery Cable), SAEJ1128 (Low Tension Primary Cable), SAEJ1560 (Low Tension Thin Wall Primary Cable).

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

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

All circuits shall conform to SAEJ1292. All circuits must be provided with low voltage over current protective devices. These devices shall be readily accessible and protected against heat in excess of component rating, mechanical damage, and water spray. Star washers shall not used for ground connections.

DIRECT GROUNDING STRAPS

Direct grounding straps shall be mounted to the following areas; frame to cab, frame to body and frame to pump enclosure.

All exposed electrical connections shall be coated with "Z-Guard 8000" to prevent corrosion.

EMI/RFI PROTECTION

The apparatus shall incorporate the latest designs in the electrical system with state of the art components to insure that radiated and conducted electromagnetic interference (EMI) and radio frequency interference (RFI) emissions are suppressed at the source

The apparatus proposed shall have the ability to operate in the environment typically found in fire ground operations with no adverse effects from EMI/RFI.

EMI/RFI susceptibility is controlled by utilizing components that are fully protected and wiring that utilizes shielding and loop back grounds where required. The apparatus shall be bonded through wire braided ground straps. Relays and solenoids that are suspect to generating spurious electromagnetic radiation are diode protected to prevent transient voltage spikes

In order to fully prevent the radio frequency interference the purchaser may be requested to provide a listing of the type, power output, and frequencies of all radio and bio medical equipment that is proposed to be used on the apparatus.

12 VOLT ELECTRICAL SYSTEM TESTING

The apparatus low voltage electrical system shall be tested and certified by the apparatus manufacture. The certification shall be provided with the apparatus. All tests shall be performed with air temperature between 0°F and 100°F.

The following three (3) tests shall be performed in order. Before each test, the batteries shall be fully charged.

TEST #1-RESERVE CAPACITY TEST

The engine shall be started and kept running until the engine and engine compartment temperatures are stabilized at normal operating temperatures and the battery system is fully charged. The engine shall be shut off and the minimum continuous electrical load shall be activated for 10 minutes. All electrical loads shall be turned off prior to attempting to restart the engine. The battery system shall then be capable of restarting the engine. Failure to restart the engine shall be considered a test failure.

TEST #2-ALTERNATOR PERFORMANCE TEST AT IDLE

The minimum continuous electrical load shall be activated with the engine running at idle speed. The engine temperature shall be stabilized at normal operating temperature. The battery system shall be tested to detect the presence of battery discharge current. The detection of battery discharge current shall be considered a test failure.

TEST #3-ALTERNATOR PERFORMANCE TEST AT FULL LOAD

The total continuous electrical load shall be activated with the engine running up to the engine manufacturers governed speed. The test duration shall be a minimum of 2 hours. Activation of the load management system shall be permitted during this test. However, an alarm sounded due to excessive battery discharge, as detected by the system, or a system voltage of less than 11.7 volts DC for a 12 volt system, for more than 120 seconds, shall be considered a test failure.

LOW VOLTAGE ALARM TEST

Following completion of the preceding tests, the engine shall be shut off. The total continuous electrical load shall be activated and shall continue to be applied until the excessive battery discharge alarm is activated.

The battery voltage shall be measured at the battery terminals. With the load still applied, a reading of less than 11.7 volts shall be considered a test failure. The battery system shall then be able to restart the engine.

At time of delivery, documentation shall be provided with the following information:

- Documentation of the electrical system performance test
- A written load analysis of the following;
  - Nameplate rating of the alternator
  - Alternator rating at idle while meeting the minimum continuous electrical load
  - Each component load comprising the minimum continuous electrical load.
  - Additional loads that, when added to the minimum continuous load, determine the total connected load.

- Each individual intermittent load.

MULTIPLEX ELECTRICAL SYSTEM WITH COLOR DISPLAY

A Weldon style V-MUX Multiplex System shall be provided. The V-MUX shall provide an on-board diagnostics and status, increase reliability and durability, minimize downtime, supply reverse polarity protection and dramatically simplify troubleshooting and repairs for the vehicle. It shall provide short and open circuit detection and notification, on board service information and reduce splices by 80-90%. Each node shall enable discrete load shedding, sequencing, diagnostics and PWM control. All V-MUX hardware shall be rated for -40° to +85° C.

A series of Multiplexing Input/Output Modules shall be installed. The Input/Output modules shall permit the multiplexing system to reduce the amount of wiring and components used as compared to non-multiplexed apparatus. These modules shall vary in I/O configuration, be waterproof allowing installation outside of enclosed areas and shall possess individual output internal circuit protection. The modules shall also have three status indicators visible from a service persons vantage point that shall indicate the status of the module. In the event a load requires more than 7.5 AMPS of operating current, the module shall activate a simple relay circuit integral to any of the 3 pillbox assemblies installed in the cab.

V-MUX integration shall be available for:

- System Voltage Meter
- Ammeter
- Emergency Flasher
- Headlamp Flasher
- Load Management
- Load Sequencer
- Back-Up Monitor
- Relays
- Circuit Breakers
- Door “Open” System
- Interlock Modules
- Engine Monitor Devices
- Separate Interlock Control
- Special Waterproof Enclosures

The Vista III Display Node shall include the following features:

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

All wiring to be appropriate gauge cross link with 311 degree F. insulation. All wires in the chassis shall be circuit numbered and function coded, in addition the SAE wiring shall be color coded. The wiring shall be protected by 275 degree F. minimum high temperature flame retardant loom as required.

INTERLOCK INTERFACE MODULE

A Vocation Module, which is the interface between the multiplexing system and the pump system shall be provided.. This module shall serve as the interface between the operator, engine, transmission and pumping system. The module shall be installed under the drivers side dash, in a sealed enclosure that shall possess green indicating LED's that shall indicate to service personnel the interlock state of the apparatus. In the event of a multiplexing error involving pump operation can be activated to ensure reliable pumping operations at ALL times. In addition to controlling pump function, this vocation module shall be able to provide automatic and/or manual activation of engine “Fast Idle”, to maintain adequate alternator output and thus, chassis voltage. NO EXCEPTIONS!

DIAGNOSTICS

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

The diagnostic system shall include the following:

- Engine diagnostic port
- Transmission and ABS diagnostic port
- Roll sensor diagnostic port (if applicable)
- Solid-state electronics diagnostic port
- Engine diagnostic switch (blink codes)
- ABS diagnostic switch (blink codes)

ADVANCED DIAGNOSTICS

An advanced, diagnostic software program shall be provided. The soft-ware shall provide troubleshooting tools to service technicians equipped with a computer. This shall consist of the Weldon #6131-0000-00 and Cummins Insight software.

The service and maintenance software shall be easy to understand and use, have the ability to view system input/output (I/O) information, and include a connection from a computer to the vehicle.

VOLTAGE MONITOR SYSTEM

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

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

INDICATOR LIGHT AND ALARM PROVE-OUT SYSTEM

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

SEQUENCER

A sequencer shall be provided that automatically activates and deactivates vehicle loads in a preset sequence thereby protecting the alternator from power surges. This sequencer operation shall 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.

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

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

Rear of cab Air-Conditioning and Heat shall be load managed.

ELECTRICAL HARNESS REQUIREMENT

To ensure dependability, all 12-volt wiring harnesses installed by the apparatus manufacturer shall conform to the following specifications:

- SAE J 1128 - Low tension primary cable
- SAE J 1292 - Automobile, truck, truck-tractor, trailer and motor coach wiring
- SAE J 163 - Low tension wiring and cable terminals and splice clips
- SAE J 2202 - 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 J 1939 - Serial communications protocol
- SAE J 2030 - Heavy-duty electrical connector performance standard
- SAE J 2223 - Connections for on board vehicle electrical wiring harnesses
- NEC - National Electrical Code
- SAE J 561 - Electrical terminals - Eyelet and spade type
- SAE J 928 - Electrical terminals - Pin and receptacle type A

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

Wiring shall be run in loom or conduit where exposed, and have grommets or other edge protection where wires pass through metal. Wire colors shall 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 shall not be allowed. Function and number codes shall be continuously imprinted on all wiring harness conductors at 3.00" intervals. All wiring installed between the cab and into doors shall be protected by a wire conduit to protect the wiring. Exterior exposed wire connectors shall be positive locking, and environmentally sealed to withstand elements such as temperature extremes, moisture and automotive fluids. Electrical wiring and equipment shall be installed utilizing the following guidelines:

- All holes made in the roof shall be caulked with silicon (no exception). Large fender washers, liberally caulked, shall be used when fastening equipment to the underside of the cab roof.
- Any electrical component that is installed in an exposed area shall be mounted in a manner that shall not allow moisture to accumulate in it. Exposed area shall be defined as any location outside of the cab or body.
- For low cost of ownership, electrical components designed to be removed for maintenance shall be quickly accessible. For ease of use, a coil of wire shall be provided behind the appliance to allow them to be pulled away from the mounting area for inspection and service work.
- Corrosion preventative compound shall be applied to non-waterproof electrical connectors located outside of the cab or body. All non-waterproof connections shall re-quire this compound in the plug to prevent corrosion and for easy separation of the plug.
- Any lights containing non-waterproof sockets in a weather-exposed area shall have corrosion preventative compound added to the socket terminal area.
- All electrical terminals in exposed areas shall have protective coating applied completely over the metal portion of the terminal.
- Rubber coated metal clamps shall be used to support wire harnessing and battery cables routed along the chassis frame rails.
- Heat shields shall be used to protect harnessing in areas where high temperatures exist. Harnessing passing near the engine exhaust shall be protected by a heat shield.
- Cab and crew cab harnessing shall not be routed through enclosed metal tubing. Dedicated wire routing channels shall be used to protect harnessing therefore improving the overall integrity of the vehicle electrical system. The design of the cab shall allow for easy routing of additional wiring and easy access to existing wiring.
- All standard wiring entering or exiting the cab shall 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 shall conform to the following requirements:

- SAE J 1127 - Battery Cable
- SAE J 561 - Electrical terminals, eyelets and spade type
- SAE J 562 - Nonmetallic loom
- SAE J 836 A - Automotive metallurgical joining
- SAE J 1292 - Automotive truck, truck-tractor, trailer and motor coach wiring
- NFPA 1901 - Standard for automotive fire apparatus

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

- Splices shall not be allowed on battery cables or battery cable harnesses.
- For ease of identification and simplified use, battery cables shall be color coded. All positive battery cables shall be marked red in color. All negative battery cables shall be black in color.
- For ease of identification, all positive battery cable isolated studs throughout the cab and chassis shall be red in color.
- For increased reliability and reduced maintenance, all electrical buss bars located on the exterior of the apparatus shall be coated to prevent corrosion.

An operational test shall be conducted to ensure that any equipment that is permanently attached

to the electrical system is properly connected and in working order.

ALTERNATOR

There shall be a Leece Neville Model 4864JB, 270 amp, serpentine belt driven alternator. The installation shall include an integral self-diagnostic regulator and rectifier for compact installations.

The alternator installation shall be designed to provide maximum output at engine idle speed in order to meet the minimum continuous electrical load of the apparatus as required.

BATTERY SYSTEM

Five (5) Exide #HP-31D, Group 31, maintenance free batteries shall be provided. Each battery shall be rated at 925 CCA at 0° F and shall have a reserve capacity of 180 minutes.

Wiring for the batteries shall be 4/0 welding type dual path starting cables for SAEJ541.

BATTERY STORAGE

Batteries shall be securely mounted in fixed 3/16” GR50 steel trays located on each side of the chassis frame. Complete access shall be provided when the cab is fully tilted. Batteries shall be mounted on non-corrosive matting material.

BATTERY BOX COVER

The battery box shall be overlaid with an "L" shaped, polished aluminum tread plate cover. This cover shall protect the batteries from road spray, snow and road debris. The cover of this box shall be easily removable for inspection, testing and maintenance of the batteries.

BATTERY DISCONNECT SWITCH

The chassis batteries shall be wired in parallel to a single 12 volt electrical system, controlled through a heavy duty, rotary type, master disconnect switch. The master disconnect switch shall be located within easy access of the driver upon entering or exiting the cab.

BATTERY JUMPER STUDS

A set of Cole Hersee battery jumper studs, model #46210-02 (red) and #46210-03 (black) shall be provided to allow the battery system to be jump started or charged from an external source. The studs shall be located on the bottom of the battery box on the driver's side of the chassis. Each stud shall be equipped with both a rubber protector cap and a 2” square non-conductive plate to prevent accidental shorting.

120 VOLT SHORELINE CONNECTION - "SUPER 30" AUTO EJECT

One (1) Kussmaul "Super 30" Auto Eject model 091-159-30-120, automatic, 120 volt, 30 amp shoreline disconnect shall be provided for the on board, 110 volt battery charging systems.

The disconnect shall be equipped with a three pin female receptacle, which shall automatically eject the shoreline when the vehicle starter is energized. A label shall be provided indicating voltage and amperage ratings.

SHORELINE POWER INLET PLATE

A shoreline power receptacle information plate shall be permanently affixed at or near the power inlet. The plate shall indicate the following;

- Type of Line Voltage
- Current Rating in Amps Power Inlet Type (DC or AC)

The Kussmaul auto-eject connection shall be equipped with a Red weatherproof cover.

The shoreline receptacle shall be located in the area directly adjacent to the driver's side cab door.

BATTERY INVERTER/CHARGER SYSTEM

The chassis shall be equipped with a Xantrex 805-1011 weatherproof battery inverter/charger. The unit shall be installed in the battery compartment and connected directly to the chassis batteries specified for the apparatus. The unit shall contain a 50 amp, 3-stage, temperature compensated battery charger to re-charge and maintain the chassis batteries when the shoreline connection has been made. The unit shall also contain a built in inverter capable of providing 1000 watts of continuous AC power and a 3000 watt surge capacity. The unit shall have a built in 20 amp transfer switch capable of diverting AC power to AC loads during shoreline connection. The unit shall also have a cab dash mounted status panel capable of indicating the shoreline connection and inverter status as well as an ON/OFF switch for the inverter.

LIGHTING - CAB INTERIOR

Four (4) combination red/white halogen dome lights shall be furnished in the cab, two (2) in the forward section and two (2) in the rear section. The lights shall be Weldon model #8086-6978-68 with euro style switch. Each dome light shall have an integral selector switch. Each dome light shall also activate when the respective, adjacent cab door is opened.

A shielded light shall be provided in each side opening, cab door step well. These lights shall activate with the respective door jamb switch.

One (1) Whelen model #700 combination red/white LED dome light(s) shall be furnished in the forward section of the cab. Each additional dome light(s) shall have an integral selector switch.

One (1) Weldon model #700 combination red/white LED dome light(s) shall be furnished in the rear crew section of the cab. Each additional dome light(s) shall have an integral selector switch.

CAB MAP LIGHT

A Sunnex model #700 high intensity, goose neck map light shall be furnished and located at the right side of the cab dash.

HAND HELD SPOTLIGHT

An Optronics #KB-4001 "Blue Eye" hand-held spotlight shall be provided. It shall have a coil-cord, a momentary switch and a 400,000 candle power lamp.

"DO NOT MOVE APPARATUS" WARNING LIGHT WITH AUDIBLE ALARM

A red flashing warning light with an integral audible alarm, shall be functionally located in the cab to signal when an unsafe condition is present such as an open cab door or body compartment door, an extended ladder rack, a deployed stabilizer, an extended light tower or any other device which is opened, extended or deployed which may cause damage to the apparatus if it is moved.

This light shall be activated through the parking brake switch to signal when the parking brake is released. This light shall be labeled "DO NOT MOVE TRUCK".

CIGARETTE LIGHTER PORT

One (1) 12 volt cigarette lighter style accessory outlet(s) shall be installed in the cab of the truck for the fire departments accessory devices. The lighter(s) shall be located as directed near the officer's seating position for devices such as cellular phones.

CIGARETTE LIGHTER PORT

One (1) 12 volt cigarette lighter style accessory outlet(s) shall be installed in the cab of the truck for the fire departments accessory devices. The lighter(s) shall be located in the rear EMS compartment, as directed, for devices such as cellular phones.

12 VOLT ACCESSORY CIRCUIT - CAB DASH

A dedicated 12 volt power and ground circuit shall be provided in the cab dash or console as required. The circuit shall be for future installation of radios or accessories.

12 VOLT ACCESSORY CIRCUIT - CREW CAB AREA

A dedicated 12 volt power and ground circuit shall be provided in the rear crew area as required. The circuit shall be for future installation of radios or accessories.

HEADLIGHTS CLUSTER

Two (2) dual, rectangular, halogen headlight modules in bright finish bezels shall be furnished on the front of the cab. Each head light module shall incorporate an individual low beam and a high beam headlight. High beam actuation shall be controlled on the turn signal lever.

DAYTIME RUNNING LIGHTS

The chassis head lights shall have integrated circuitry to actuate the low beam headlights at a maximum of 80 percent of capacity whenever the chassis engine is running.

The daytime running lights shall be interlocked with the parking brake.

ALTERNATE FLASHING HEADLIGHT SYSTEM (WIG-WAGS) SELECTED

SECONDARY DUAL LIGHT MODULE

Two (2) Whelen 60A00TAR arrow shaped, amber LED turn signals shall be provided, one (1) in each side of the dual light module above the headlights.

The NFPA required, Zone "A" lower warning lights shall be incorporated into each side dual light module noted above.

DOT MARKER LIGHTS AND REFLECTORS

Five (5) DOT approved Whelen (or equal) Light Emitting Diode (LED) cab marker lamps shall mounted on the top front edge of the cab roof.

Amber LED marker lights with integral reflectors shall be provided on the side of the cab above the front wheel well, one (1) each side.

Truck-Lite Model #18 red LED marker lights with integral reflectors shall be provided at the lower side rear, one (1) each side.

Truck-Lite #60115Y yellow LED side marker and turn lights shall be provided on the apparatus lower side, forward of rear axle, one (1) each side.

Truck-Lite Model #19 red LED clearance lights shall be provided on the apparatus rear upper, one (1) each side at the outermost practical location.

Truck-Lite Model #33740R LED 3-lamp identification bar will be provided on the apparatus rear center. The lights shall be red in color.

Truck-Lite #98034Y yellow reflectors shall be provided on the apparatus body lower side, as far forward and low as practical, one (1) each side if the apparatus is 30' long or longer.

Truck-Lite #98034R red reflectors shall be provided on the apparatus rear, one (1) each side at the outermost practical location.

LICENSE PLATE LIGHT - REAR

One (1) license plate light shall be provided above the mounting position of the license plate. The light shall be clear in color.

TAIL, STOP, TURN AND BACK-UP LIGHTS

Two (2) Whelen 600 series, 4-1/8" x 6-1/2", LED red combination tail and stop lights, shall be mounted one each side at the rear of the body with a chrome mounting flange.

Two (2) Whelen 600 series, 4-1/8" x 6-1/2", LED amber arrow turn signal lights, shall be mounted one each side, on a vertical plane with the tail/stop lights with a chrome mounting flange.

Two (2) Whelen 600 series, 4-1/8" x 6-1/2", LED white back-up lights, shall be mounted with a chrome mounting flange, one each side on a vertical plane with the turn/tail/stop signals. These lights shall activate when the transmission is placed in reverse gear.

AUXILIARY REVERSE LIGHTS

Two (2) Zico #ZQL-SS-H7614 "Quic-Light" lights shall be provided in the rear wheel well panels, one (1) each side. The lights shall be recessed into the wheel well panel and shall be equipped with a stainless steel housing. The lights shall be activated by the reverse light circuit when the apparatus is operating as an emergency vehicle (Primary Warning Switch On).

CAB STEP LIGHTS

Chrome plated Whelen model #T0C0ACCR, LED chassis step lights shall be provided and controlled with marker light actuation. The lights shall be surface mounted using Whelen #TFLANGEC, chrome plated flange. Step lights shall be located to properly illuminate all chassis access steps and walkway areas.

BODY STEP LIGHTS

Chrome plated Whelen model #0AC0EDCR, shielded LED body step lights shall be provided and controlled with marker light actuation. Step lights shall be located to properly illuminate all chassis access steps and walkway areas.

DUNNAGE AREA LIGHTING

Two (2) chrome plated Weldon model #9186, shielded halogen lights shall be provided in the dunnage area to provide adequate illumination of this area.

SCENE LIGHTS - BEHIND FRONT CAB DOORS

Two (2) Whelen M9ZC super LED scene lights shall be provided, one on each side of the cab, directly behind the front cab entrance door in a chrome plated flange. The scene lights shall be controlled by a rocker switch in the master warning light switch console. All scene lights shall be wired through the load management system.

SCENE LIGHTS - REAR OF BODY

Two (2) Whelen M9ZC super LED scene lights shall be provided, one on each side of the rear body panel in a chrome plated flange. The scene lights shall be controlled by a rocker switch in the master warning light switch console. All scene lights shall be wired through the load management system.

REAR SCENE LIGHTS - ADDITIONAL ACTIVATION

In addition to the cab mounted switch for the rear scene lights, the rear scene lights shall illuminate when the transmission is placed in reverse gear and the apparatus is operating as an emergency vehicle (Primary Warning switch on).

Upper Side Body Scene Lights, Front

One pair of FRC FOCUS FCA200-M12 Floodlights, 1000W240V recessed wall mount shall be mounted one each upper side forward on the body.

Upper Side Body Scene Lights, Rearward

One pair of FRC FOCUS FCA200-M12 Floodlights, 1000W240V recessed wall mount shall be mounted one each upper side rearward on the body.

GROUND LIGHTS - CAB

One (1) Amdor Luma Bar H2O LED 20" ground light shall be provided under each side cab door entrance step, four (4) total. The ground lights shall turn on automatically with each respective door jamb switch and also by a master ground light switch in the warning light switch console.

Each light shall illuminate an area at a minimum 30" outward from the edge of the vehicle.

ROOF MOUNT 150W HID BROW LIGHT - ABOVE WINDSHIELD

A Fire Research Optimum model OPA800-HD15 contour roof mount light shall be installed. The mounting brackets shall attach to the bottom of the lamphead and be machined to conform to the roof radius. Wiring shall extend from a weatherproof strain relief at the rear of the lamphead.

The lamphead shall have one (1) High Intensity Discharge (HID) 150 watt 12 volt bulb. The bulb shall draw 12.5 amps and generate 11,250 lumens. The bulb shall be accessible through the front. The lamphead shall incorporate a vacuum deposit polished reflector and two optimizing mirrors to produce a uniform beam that lights up an area 100° vertically by 150° horizontally. The lamphead shall have a heat dissipating curved front lens. The curve of the lens shall have a radius of 5.16 inches to optimize light emission. The lamphead shall be no more than 5 3/4" deep by 5 1/8" high by 8 3/4" wide. Lamphead and brackets shall be powder coated white.

The Optimum brow mounted flood light shall be located above the windshield in the center of the cab.

LIGHTS ABOVE WINDSHIELD MASTER POWER SWITCH

A master power switch shall be provided in the cab warning light switch console to turn the lights above windshield on and off.

****** BODY ELECTRICAL SYSTEM ******

12 VOLT BODY ELECTRICAL SYSTEM

All electrical lines in the body shall be protected by automatic circuit breakers, conveniently located to permit ease of service. Flashers, heavy solenoids and other major electrical controls shall be located in a central area near the circuit breakers.

All lines shall be color and function coded every 3", easy to identify, oversized for the intended loads and installed in accordance with a detailed diagram. A complete wiring diagram shall be supplied with the apparatus.

Wiring shall be carefully protected from weather elements and snagging. Heavy duty loom shall be used for the entire length. Grommets shall be utilized where wiring passes through panels.

In order to minimize the risk of heat damage, wires run in the engine compartment area shall be carefully installed and suitably protected by the installation of heat resistant shielded loom.

All electrical equipment shall be installed to conform to the latest federal standards as outlined in NFPA 1901.

BODY ELECTRICAL JUNCTION COMPARTMENT

A weather resistant electric junction compartment shall be provided in the left side lower front compartment. This compartment shall be recessed through the inside rear wall of the compartment to provide an easily accessible enclosure to house all of the body wiring junction points, terminal strips, solenoids, etc. The design of this compartment shall not decrease the storage capacity area of the compartment in which it is located. A removable panel shall be provided for access to this compartment.

PUMP ENCLOSURE WORK LIGHTS

Work lighting shall be provided inside the pump enclosure providing a minimum of 20 candlepower illumination.

ENGINE COMPARTMENT WORK LIGHTS

Work lighting shall be provided inside the engine enclosure that will provide a minimum of 20 candlepower illumination.

AMDOR LUMA BAR TRACK MOUNTED COMPARTMENT LIGHTS - LED

Each individual, equipment storage compartment shall be equipped with the AMDOR Luma Bar LED light fixture mounted one each side of the forward (and rear) vertical door frame.

NFPA LIGHTING PACKAGE

The following warning light package shall include all of the minimum warning light and actuation requirements for the current revision of the NFPA 1901 Fire Apparatus Standard. The lighting as specified shall meet the requirements for both "Clearing Right of Way" and "Blocking Right of Way" as noted.

LIGHT PACKAGE ACTUATION CONTROLS

The entire warning light package shall be actuated with a single warning light switch located on the cab switch panel. The wiring for the warning light package shall engage all of the lights required for "Clearing Right of Way" mode when the vehicle parking brake is not engaged. An automatic control system shall be provided to switch the warning lights to the "Blocking Right of Way" mode when the vehicle parking brake is engaged.

UPPER LEVEL LIGHTING - WHELEN

NFPA ZONE A, UPPER

A Whelen #FNQLED "Edge Freedom", 82" cab roof warning lightbar shall be furnished and rigidly mounted on top of the cab roof. The lightbar shall be equipped with the following:

- Two Front Corner Red Linear LED's
- Two Red Forward Facing Linear LED's
- Two White Forward Facing Linear LED's
- Two Red End Linear LED's

The forward facing clear LED flashers shall be disabled automatically for the "Blocking Right of Way" mode.

The Freedom light bar shall be equipped with a #795H Low Profile LED Opticom emitter. The Opticom emitter shall be disabled automatically for the "Blocking Right of Way" mode.

NFPA ZONE C, UPPER

Two (2) Whelen B6T series rotating halogen beacon lights with integral lower level directional LED light shall be mounted one (1) each side at the rear of the body. A B6TMRR1P red beacon light with red lower LED shall be provided on each side.

NFPA ZONES B & D REAR, UPPER

The lighting requirement for this area is covered by the lights noted in Zone "C" - Upper.

NFPA ZONES B & D FRONT, UPPER

The lighting requirement for this area is covered by the lights noted in Zone "A" - Upper.

LOWER LEVEL LIGHTING - WHELEN

NFPA ZONE A, LOWER

Two (2) Whelen #60R02FRR linear super LED light heads shall be provided and installed one (1) each side. Each light shall be equipped with a red lens and chrome plated mounting flange.

The lower Zone A warning lights shall be mounted in the custom chassis headlight bezels.

NFPA ZONE C, LOWER

Two (2) Whelen #60R02FRR linear LED light heads shall be provided and installed one (1) each side directly below the DOT stop, tail, turn and backup lights. Each light shall be equipped with a red lens and chrome plated mounting flange.

NFPA ZONES B & D FRONT, LOWER

Two (2) Whelen #60R02FRR linear super LED light heads shall be provided and installed one (1) each side. Each light shall be equipped with a red lens and chrome plated mounting flange.

The lower Zone B & D warning lights shall be mounted on the sides of the custom chassis front bumper.

NFPA ZONES B & D MIDSHIP, LOWER

Two (2) Whelen #60R02FRR linear super LED light heads shall be provided and installed one (1) each side. Each light shall be equipped with a red lens and chrome plated mounting flange.

NFPA ZONES B & D REAR, LOWER

Two (2) Whelen #60R02FRR linear super LED light heads shall be provided and installed one (1) each side. Each light shall be equipped with a red lens and chrome plated mounting flange.

WARNING LIGHT SYSTEM CERTIFICATION

The warning light system(s) specified above shall not exceed a combined total amperage draw of 45 AMPS with all lights activated in either the "Clearing Right of Way" or the "Blocking Right of Way" mode.

The warning light system(s) shall be certified by the light system manufacturer(s), to meet all of the requirements in the current revision of the NFPA 1901 Fire Apparatus Standard as noted in the General Requirements section of these specifications. The NFPA required "Certificate of Compliance" shall be provided with the completed apparatus.

ALTERNATING FLASHING HEADLIGHT SYSTEM

An alternating flashing wig-wag system, wired to the apparatus headlights, shall be installed. The wig-wag system shall be individually switched at the master light console and wired through the load management system to be shut down when load management is required. The alternating flashing system shall be automatically disabled during the "Blocking Right of Way" mode.

ROOF MOUNTED LIGHT BARS

A pair of Whelen model FNMINI, 24" Freedom, cab roof warning light bars shall be furnished and rigidly mounted, one (1) at each side on the cab roof facing to each side of the unit. Each light bar shall be equipped with two (2) red corner LED's, one (1) forward facing LED and one (1) side facing LED. All the lenses shall be clear.

The lights specified above shall be provided in addition to the NFPA required Optical Warning Light Package and shall be switched independently from the light package. Additionally, wiring for the independently switched lights specified, shall be run through the Load Management System to ensure that the electrical system is not overloaded by the additional amperage draw requirements.

ELECTRIC HORN

A single electric horn activated by the steering wheel horn button shall be furnished.

BACK-UP ALARM

A Code 3, model #D450C, 87dBA back-up alarm, shall be provided and installed at the rear of the apparatus under the tailboard. The back-up alarm shall activate automatically when the transmission is placed in reverse gear and the ignition is "on".

AIR HORNS

Two (2) chrome plated air horns shall be at the front of the vehicle. The air horns shall be mounted in full compliance with NFPA-1901. The supply lines shall be dual 1/4" lines with equal distance from each horn.

Each air horn shall be recessed in the front bumper, one (1) on the driver's side and one (1) on the officer's side.

The air horn(s) shall be controlled by dual ceiling mounted lanyard cables, located in the center of the cab.

ELECTRONIC SIREN AND SPEAKER

One (1) Whelen # 295HFSA7, dual tone, 200 watt electronic siren shall be provided featuring: flush mount remote control head recessed in center dash panel as space allows, "Si-Test" self diagnostic feature, six (6) function siren, radio repeat, public address and a removable microphone.

The electronic siren and speaker shall meet the NFPA required SAE certification to ensure compatibility between the siren and speaker.

Two (2) Whelen, model # SA122FMP polished aluminum siren speakers shall be provided, recessed in the front bumper and wired to the electronic siren.

FEDERAL Q2B MECHANICAL SIREN

One (1) Federal Model #Q2B mechanical siren shall be provided to provide audible warning.

The Q2B siren shall be wired through the load management system to prevent excessive amperage draw. The siren shall be provided in addition to the required minimum NFPA audible warning requirements.

The Q2-B siren shall be pedestal mounted on top of the extended bumper on the driver's side. The siren shall be equipped with a Federal model #P, chrome housing and pedestal.

Two (2) Linemaster #632 floor mounted foot switches shall be provided, one (1) for the officer and one (1) for the driver. A siren brake button shall be provided near the driver's position.

FIRECOM MODEL #3010 INTERCOM SYSTEM

A Firecom model #3010 intercom system shall be provided in the front of the cab. The system shall be capable of interfacing with a two-way radio system (note: an authorized two-way radio installer shall be responsible for interfacing the intercom system with the two-way radio). The master station shall be capable of accepting up to six positions (plus exterior positions), and utilize a 12 volt nominal power supply. The unit shall have a touch screen adjustable volume control and have advanced noise reducing circuitry.

The intercom system shall include:

DRIVERS AND OFFICERS HEADSETS & BASE STATION FOR WIRELESS FIRECOM SYSTEM

Two (2) UHW-10 wireless under helmet radio transmit headsets, each with their own paired base station, shall be furnished for the driver and officer seating locations in the cab. The headsets shall have adjustable volume, noise-canceling electric microphone, adjustable head strap, a flex-style boom which rotates for left or right dress and a charging port to connect the 12 volt charger when the headset is not in use. The sets shall also have comfortable liquid foam ear seals.

The base station shall be connected via a 6 conductor flat RJ-6 cable to any headset port on the Firecom 3010 series intercom. The base station will provide full duplex audio communication between the wireless headset and the intercom as well as PTT communication through the apparatus mobile radio.

Two (2) rubber coated steel headset hanger hooks shall be furnished in the front section of the cab to hold the driver and offer intercom headsets while not in use.

RADIO INTERFACE CABLE

One (1) radio interface cable, model #110-5101-30-20 shall be provided and installed from the firecom base unit to the area of where the mobile radio base station shall be mounted. The end of the cable that connects to the mobile radio shall be un-terminated and shall be the responsibility of the radio installer to provide and install the correct adapter to connect the cable to the mobile radio.

WEATHER BAND AM/FM/CD RADIO

A Panasonic CQ-5302U Weather Band/AM/FM, CD, MP3, Satellite ready player shall be installed in the cab overhead panel as space allows. The speakers shall be located as follows:

- (2) JVC CS-V425 4 inch mounted in the Front of the cab
- (2) JVC CS-V625 6 inch mounted in the Rear of the cab

****** PUMP AND PLUMBING ******

PUMP

- **WATEROUS CSU-C20**
- **2000 G.P.M.**
- **SINGLE-STAGE**

The pump shall be of single-stage construction and shall comply with all applicable requirements of the latest standards for automotive fire apparatus of the National Fire Protection Association, NFPA-1901 and shall have a rated capacity of 2000 gpm.

The pump must deliver the percentage of rated capacity at the pressure listed below:

- 100% of rated capacity at 150 P.S.I. net pump pressure
- 100% of rated capacity at 165 P.S.I. net pump pressure
- 70% of rated capacity at 200 P.S.I. net pump pressure
- 50% of rated capacity at 250 P.S.I. net pump pressure

When dry, the pump shall be capable of taking suction and discharge water with a lift of 10 feet in not more than 30 seconds through 20 feet of appropriate size suction hose.

The pump shall be free from objectionable pulsation and vibration under all normal operating conditions.

PUMP CONSTRUCTION

The pump body shall be close-grained gray iron and must be horizontally split in two sections for easy removal of the impeller shaft assembly, and designed for complete servicing from the bottom of the truck without disturbing setting of the pump in the chassis or apparatus piping which is connected to the pump. Pump body halves shall be bolted together on a single horizontal face to minimize chance of leakage and facilitate reassemble.

Discharge manifold shall be cast as an integral part of the pump body assembly and shall provide at least three full 3-1/2 inch openings for ultimate flexibility in providing various discharge outlets for maximum efficiency, and shall be located as follows: one outlet on the right side of the pump body, one outlet on the left side of the pump body, and one outlet on top of the pump discharge manifold.

IMPELLER SHAFT

The impeller shaft shall be stainless steel, accurately ground to size, and supported at each end by oil or grease lubricated, anti-friction bearings for rigid and precise support. Bearings shall be protected from water and sediment by suitable stuffing boxes, flinger rings and oil seals. The impeller shaft shall be of two-piece construction separable between the pump and pump transmission to allow true separation of the transmission from the pump without disassembly of either component. No sleeve type bearings shall

be used.

PUMP PACKING

Stuffing boxes shall be equipped with two-piece glands to permit adjustment or replacement of packing without disturbing the pump. Lantern rings shall be located at the inner end of the stuffing boxes the all ring can be removed without removal of the lantern rings. Water shall be fed into the stuffing box lantern rings for proper lubrication and cooling when the pump is operating.

PUMP IMPELLER

The impeller shall be bronze, accurately balanced (mechanically and hydraulically), of mixed flow design with reverse flow labyrinth-type wear rings that resist water bypass and loss of efficiency due to wear.

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

PUMP TRANSMISSION

The pump transmission shall be an all aluminum **"C20"** model, rigidly attached to the pump body assembly and be of latest design incorporating a high strength involute tooth-form Hy-Vo chain drive. The driven sprockets shall be capable of operating at high speeds to provide smooth, quiet transfer of power. The shift engagement shall be accomplished by a free-sliding collar and shall incorporate an internal locking mechanism to insure that the collar shall be maintained in ROAD or PUMP position.

PUMP RATIO

The pump ratio shall be selected by the apparatus manufacturer to give maximum performance with the engine and transmission selected.

The manufacturer shall supply at time of delivery copies of the pump manufacturer's certification of hydrostatic testing, the engine manufacturer's current certified brake horsepower curve.

PUMP SHIFT

The pump shift shall be pneumatically operated and shall incorporate a standard automotive air valve shifting mechanism for ease of maintenance and parts availability. The pump shift valve shall be mounted in the cab and identified as **PUMP SHIFT**, and include shift instructions permanently inscribed on the pump shift switch plate. The in cab control valve shall include a detent lock to prevent accidental shifting.

EMERGENCY PUMP SHIFT

An emergency manual pump shift control shall be furnished on the left side pump panel which may be utilized if the air shift control does not operate.

A transmission, manual lock-up switch shall be furnished in the cab to ensure positive lock-up of the transmission.

PUMP SHIFT INDICATORS LIGHT

The pump shift assembly shall incorporate an indicating light system which shall warn the operator if the shift to PUMP has not been completed and indicate when it has been completed. The switch that activates the lights must be mounted on the pump transmission and positioned so that the pump shift arm activates the switch only when the shift arm has completed its full travel into PUMP

position.

TRANSMISSION LOCK

The automatic transmission furnished in the chassis shall have a lock-up assembly which brings the transmission to direct drive and prevents the transmission from shifting gears while in the pumping mode.

BRAKING SYSTEM

A positive braking system shall be provided to prevent vehicle movement during pumping operations. The air brakes furnished must satisfy this requirement.

MAIN PUMP MOUNTS

Extra heavy duty pump mounting brackets shall be furnished. These shall be bolted to the frame rails in such a position to perfectly align the pump so that the angular velocity of the drive line joints shall be the same on each end of the drive shaft. This shall assure full capacity performance with a minimum of vibration. Mounting hardware shall utilize Grade 8 bolts.

Pumps which are not mounted directly to the frame will not be considered. Under no circumstance shall the pump function as a frame cross member.

******* PRESSURE CONTROL & ACCESSORIES *******

PRESSURE RELIEF VALVE

A Waterous relief valve system shall be positive and quick acting, and shall have a control valve to provide instantaneous hydraulic lock-out which does not require the operator to cancel out or disturb the pressure setting. Relief valve control (pilot valve) shall be protected from malfunction due to sand or other sediment in the water by a strainer which can be removed, cleaned and replaced from the operator's panel while the pump is operating. Relief valve indicator lights shall be provided and mounted on the panel adjacent to the pilot valve assembly. The indicator lights are to be "amber" and marked OPEN to indicate the relief valve is bypassing and "green" marked CLOSED to indicate when the relief valve is closed.

INTAKE RELIEF VALVE

A Waterous pilot operated intake relief valve shall be provided by the pump manufacture. The pilot valve shall be mounted in a position specified by the purchaser, and allow adjustment from 50 psi to 250 psi. The pilot operated intake relief valve shall allow full opening of the relief valve with a very small rise in intake pressure above the set pressure.

PUMP CERTIFICATION

The pump shall be third party performance tested to meet the requirements of NFPA-1901. To ensure top quality and integrity, the test company shall be Underwriter's Laboratories (UL). NO EXCEPTIONS!

PRIMING PUMP

The priming pump shall be a 12-volt Waterous model VPO Oil-Less, positive displacement vane type, electrically driven. One priming control shall open the priming valve and start the priming motor. The primer shall be capable of priming without the use of primer oil. The primer shall be connected to the power source with a 300 amp fusible link.

The primer shall be activated by a mechanical/electrical valve with a single push/pull rod control located on the pump operator's panel. Valve actuation may be accomplished while the main pump is operational, if necessary to assure complete prime.

An additional primer control valve shall be furnished, piped directly to the front suction line piping. The priming valve shall activate the standard pump primer to minimize pump cavitation during remote suction operations and shall be located on the pump operator's panel.

MASTER DRAIN

The Waterous manifold drain assembly shall consist of a stainless steel plunger in a bronze body with multiple ports. The valve shall be designed so that pump discharge pressure prevents it from opening accidentally. The drain valve control shall be panel mounted, cable or rod operated and identified PUMP DRAIN.

INDIVIDUAL BLEEDERS AND DRAINS

All lines shall drain through the master drain valve or shall be equipped with individual drain valves, easily accessible and labeled.

One (1) individual "TRIDENT" quarter turn drain valve shall be furnished for each 1-1/2" or larger discharge port and each 2-1/2" gated auxiliary suction.

Drain/bleeder valves shall be located at the bottom of the side pump module panels.

All drains and bleeders shall discharge below the running boards.

SYNFLEX SUCTION, DISCHARGE, PRESSURE AND CONTROL LINES

Small lines within the pump enclosure shall be constructed from Synflex hose. Uses include, but are not limited to such lines as priming control, gauge lines, drain lines, air control valves, pump shift, supplemental cooling, foam flush and air bleeder valves.

ANODE BLOCKS

Four (4) Waterous zinc anode blocks shall be provided and located two (2) on the suction side and two (2) on the discharge side of the pump to protect the pump from corrosion.

The Anodes shall be painted Safety Yellow for identification purposes.

PUMP OVERHEAT INDICATOR SYSTEM

A Waterous Overheat Protection Manager (OPM) shall be provided to serve as a safety device by releasing hot water from the discharge area of the pump to the ground or back to a water tank. The OPM consists of a valve that opens when the water in the pump reaches 140 F (60 C) and a warning light that is triggered by a thermal switch when the water in the pump reaches 180 F (82 C). The warning light acts as an additional protection device if the temperature inside the pump keeps rising although the valve is open. The OPM valve and switch are both mounted on two 1/2” tapped holes located near the center discharge area of the pump.

TOP MOUNT PUMP MODULE

The pump module shall be a self-supported structure mounted independently from the body and chassis cab. The design must allow normal frame deflection without imposing stress on the pump module

structure or side running boards. The pump module shall be securely mounted to the chassis frame rails.

The pump module shall incorporate a formed structure on the top front to support the top mount control panel and required mechanical control handles.

TOP MOUNTED VALVE CONTROLS

The valves shall be controlled by vertically operated swing handles. Each handle shall be equipped with a twist-lock, easy-grip knob. The valve control handles shall be mounted in-line. Each valve control handle shall be connected to its respective valve via a control rod and a bell crank mechanism, if needed. Each control rod shall consist of a 1/2" pipe welded to a threaded stud to form a rigid linkage. Each pressure gauge shall be located directly above its respective discharge control handle, and shall be clearly marked by color coded name plates.

The pump module shall be a welded frame work utilizing structural steel components properly braced to withstand the rigors of chassis frame flex.

DUNNAGE AREA

A dunnage area shall be provided above the pump enclosure, behind the top mount control panel, for equipment mounting and storage. This area shall be furnished with a removable 3/16" aluminum tread plate floor and shall be enclosed on the sides.

NOTE: The size of this storage area may vary when top mounted crosslays, booster reel(s), etc., are specified and located in this area.

TRANSVERSE WALKWAY

There shall be a transverse walkway located at the rear of the chassis cab, ahead of the pump module. The walkway shall be constructed of 3/16" aluminum tread plate and shall be clear and unobstructed for through traffic.

A miscellaneous equipment storage compartment shall be provided at either side of the walkway, outboard of the chassis frame rails. A vertically hinged, aluminum tread plate door with positive closure latch shall be provided on the outboard face of each compartment. Compartments shall be ventilated.

******* PUMP SUCTIONS & AUXILIARY INLETS *******

SUCTION INLETS

Two (2) 6" N.S.T. suction inlets shall be provided, one on the driver side pump panel and one on the officer side pump panel. A removable strainer shall be installed on each inlet.

PUMP SUCTION ENDS

The main pump suction inlets shall be furnished with a short suction end, terminating with only the suction threads protruding through the side panel to minimize the distance an exterior appliance protrudes beyond the pump panel.

One (1) 6" NST chrome plated long handle pressure vented cap shall be installed on each.

FRONT SUCTION

A 6" N.S.T. front suction inlet shall be provided at the front of the vehicle, plumbed from the pump.

The front inlet shall be located above the right hand side of the front bumper extension and shall terminate with a chromed brass, chicksan style swivel to allow a minimum of 180 degree rotation of the inlet for suction hose attachment.

The front suction pipe shall be equipped with a chrome 6" NSTM thread adapter.

The front inlet shall be plumbed utilizing 5", schedule 10 stainless steel piping, 45 degree weld elbows and a limited number of 90 degree sweep elbows in a welded assembly from the pump to the front of the cab.

A minimum of two (2) grooved pipe couplings shall be furnished in this assembly to allow for flex and serviceability.

The front suction plumbing shall be fitted with a Waterous "Monarch" valve, on the front suction inlet. The valve shall be in the pump enclosure area with a manual override located directly on the valve actuator. The valve body and all related components that are in contact with water shall be manufactured of fine grained, corrosion resistant bronze.

The valve shall be electrically operated by a toggle switch control, mounted on the operator's panel. The electric control shall incorporate a placard with status lights to indicate whether the valve is in the closed, open or throttled position.

The valve housing shall incorporate a pressure relief valve, set at the pump manufacturers facility to a rating of 125 PSI. The pressure relief valve shall provide protection for the suction hose even with the valve in the closed position. The valve shall incorporated a NFPA compliance, large diameter hose air bleed valve, controlled at the operator's panel.

One (1) 6" NST chrome plated long handle vented cap(s) shall be installed on front suction.

AUXILIARY SIDE SUCTION(S)

One (1) 2-1/2" auxiliary suction shall be provided at the driver side pump panel, to the rear of the main inlet. The 2-1/2" auxiliary suction shall terminate with a removable strainer, chrome plated 2-1/2" NST female swivel with a chrome plated plug and retaining chain.

A 2 1/2" Akron #8800 series full flow, stainless steel ball valve shall be provided for the driver side rear auxiliary suction.

A 1/4 turn swing control handle shall be provide on the driver side rear auxiliary suction valve

One (1) 2-1/2" auxiliary suction shall be provided at the officer side pump panel, to the front of the main inlet. The 2-1/2" auxiliary suction shall terminate with a removable strainer, chrome plated 2-1/2" NST female swivel with a chrome plated plug and retaining chain.

A 2 1/2" Akron #8800 series full flow, stainless steel ball valve shall be provided for the officer side front auxiliary suction.

A 1/4 turn swing control handle shall be provided on the officer side front auxiliary suction valve

All side gated inlet valves shall be recess mounted behind the side pump panels or body panels. (No Exceptions)

TANK TO PUMP

One (1) 3" tank to pump line shall be, piped through the front bulkhead of the tank with a 90 degree elbow down into the tank sump. This line shall be plumbed directly into the rear of the pump suction manifold for maximum efficiency.

A check valve shall be provided to prevent accidental pressurization of the water tank through the pump connection. Connection from the valve to the tank shall be made by using a non-collapsible flexible rubber hose.

A 3" Akron #8800 series full flow, stainless steel ball valve shall be provided between the pump suction manifold and the water tank.

A locking push/pull control handle shall be located on the operator's panel with function plate.

TANK FILL

One (1) 2 1/2" gated full flow pump to tank refill line controlled at the pump panel shall be provided. A deflector shield inside the tank shall be furnished. Tank fill plumbing shall utilize 2 1/2" high pressure hose for tank connection to accommodate flexing between components. (NO EXCEPTIONS)

A 2 1/2" Akron, #8800 series, full flow, stainless steel ball valve shall be provided between the pump discharge manifold and the water tank.

A locking push/pull control handle shall be located on the operator's panel with function plate.

******* DISCHARGES & ACCESSORIES -SIDE MOUNT *******

DRIVER'S SIDE MAIN DISCHARGE #1

A discharge shall be provided and located at the driver's side pump panel. The driver's side discharges #1 shall terminate with NST threads, through the left panel above the main pump intake.

The main pump discharge shall be plumbed directly from the pump discharge manifold utilizing direct connect discharge valve flanges.

A 2 1/2" Akron, #8800 series, full flow, stainless steel ball valve shall be provided for the driver's side #1 discharge. The valve shall be equipped with the Akron "Tork-Lok" feature.

The discharge valve shall be equipped with integral 2 1/2" NST, 30 degree, chrome plated elbow.

A 2 1/2 " NST chrome plated pressure vented cap shall be installed on driver's side #1 discharge.

The driver's side #1 discharge valve shall be controlled by a locking push/pull swing handle located on the top mount operator's panel.

The driver's side #1 discharge shall be equipped with a Class One Sub-Z II, 3 ½” diameter silicone filled pressure gauge with pulse and vibration dampening. To prevent internal freezing, the stem and Bourdon tube shall be filled with low temperature oil and be sealed from the water system using an

isolating diaphragm located in the stem. A bright metal bezel shall be supplied for resistance to corrosion and to protect the lens and case from damage. The gauge face shall be white with black numerals.

DRIVER'S SIDE MAIN DISCHARGE #3

A discharge shall be provided and located at the driver's side pump panel. The driver's side discharges #3 shall terminate with NST threads, through the left panel above the main pump intake.

The main pump discharge shall be plumbed directly from the pump discharge manifold utilizing direct connect discharge valve flanges.

A 4" Akron, #8800 series, full flow, ball valve shall be provided for the driver's side #3 discharge.

The discharge valve shall be equipped with integral 4" NST, 30 degree, chrome plated elbow.

A 4" NST chrome plated pressure vented cap shall be installed on driver's side #3 discharge.

The driver's side #3 discharge valve shall be equipped with an Akron Brass Style 9313 Valve Controller. The electric controls must be of current limiting design, requiring no clutches in the motor. The unit must have booted switches with momentary open and close as well as an optional one touch full open feature to operate the actuator. The unit must provide position indication through 10 LED light indicators for maximum visibility.

The driver's side #3 discharge shall be equipped with a 2 ½ " diameter Noshok pressure gauge. The gauge shall have a rugged corrosion free stainless steel case and clear scratch resistant molded crystals with captive O-ring seals to ensure distortion free viewing and seal the gauge. The gauge shall be filled with a synthetic mixture to dampen shock and vibration, lubricate the internal mechanisms, prevent lens condensation and ensure proper operation from –40°F to +160°F.

The gauge shall exceed ANSI B40.1 Grade A requirements with an accuracy of +/- 1.5% full scale and include a size appropriate phosphorous bronze bourdon tube with a reinforced lap joint and large tube base to increase the tube life and gauge accuracy.

A polished chrome-plated stainless steel bezel shall be provided to prevent corrosion and protect the lens and gauge case. The gauge shall have black graphics on a white background.

OFFICER'S SIDE MAIN DISCHARGE #1

A discharge shall be provided and located at the officer's side pump panel. The officer's side discharges #1 shall terminate with NST threads, through the officer's side panel above the main pump intake.

The main pump discharge shall be plumbed directly from the pump discharge manifold utilizing direct connect discharge valve flanges.

A 2 1/2" Akron, #8800 series, full flow, stainless steel ball valve shall be provided for the officer's side #1 discharge. The valve shall be equipped with the Akron "Tork-Lok" feature.

The discharge valve shall be equipped with integral 2 1/2" NST, 30 degree, chrome plated elbow.

A 2 1/2" NST chrome plated pressure vented cap shall be installed on officer's side #1 discharge.

The officer's side #1 discharge valve shall be controlled by a locking push/pull swing handle located on the top mount operator's panel.

The officer's side #1 discharge shall be equipped with a Class One Sub-Z II, 3 ½" diameter silicone filled pressure gauge with pulse and vibration dampening. To prevent internal freezing, the stem and Bourdon tube shall be filled with low temperature oil and be sealed from the water system using an isolating diaphragm located in the stem. A bright metal bezel shall be supplied for resistance to corrosion and to protect the lens and case from damage. The gauge face shall be white with black numerals.

OFFICER'S SIDE MAIN DISCHARGE #2

A discharge shall be provided and located at the officer's side pump panel. The officer's side discharges #2 shall terminate with NST threads, through the officer's side panel above the main pump intake.

The main pump discharge shall be plumbed directly from the pump discharge manifold utilizing direct connect discharge valve flanges.

A 4" Akron, #8840 series, full flow, flat ball valve shall be provided for the officer's side #2 discharge.

The discharge valve shall be equipped with integral 4" NST, 30 degree, chrome plated elbow.

A 4" NST chrome plated pressure vented cap shall be installed on officer's side #2 discharge.

The officer's side #2 discharge valve shall be equipped with an Akron Brass Style 9313 Valve Controller. The electric controls must be of current limiting design, requiring no clutches in the motor. The unit must have booted switches with momentary open and close as well as an optional one touch full open feature to operate the actuator. The unit must provide position indication through 10 LED light indicators for maximum visibility.

The officer's side #2 discharge shall be equipped with a 2 ½ " diameter Noshok pressure gauge. The gauge shall have a rugged corrosion free stainless steel case and clear scratch resistant molded crystals with captive O-ring seals to ensure distortion free viewing and seal the gauge. The gauge shall be filled with a synthetic mixture to dampen shock and vibration, lubricate the internal mechanisms, prevent lens condensation and ensure proper operation from –40°F to +160°F.

The gauge shall exceed ANSI B40.1 Grade A requirements with an accuracy of +/- 1.5% full scale and include a size appropriate phosphorous bronze bourdon tube with a reinforced lap joint and large tube base to increase the tube life and gauge accuracy.

A polished chrome-plated stainless steel bezel shall be provided to prevent corrosion and protect the lens and gauge case. The gauge shall have black graphics on a white background.

DRIVER SIDE REAR DISCHARGE

A 2 1/2" NST rear discharge shall be provided at the rear of the vehicle, plumbed from the pump.

The rear discharge shall terminate on the rear body panel, on the driver side of the body.

The driver side rear discharge pipe shall be equipped with a chrome 2 1/2" NSTM thread adapter.

The driver side rear discharge shall be plumbed utilizing 2 1/2" schedule 40, galvanized piping, 45 degree threaded elbows and a limited number of 90 degree sweep elbows in an assembly from the pump to the rear of the vehicle.

A minimum of one (1) grooved pipe coupling shall be furnished in this assembly to allow for flex

and serviceability.

A 2 1/2" Akron, #8800 series, full flow, stainless steel ball valve shall be provided for the driver side rear discharge. The valve shall be equipped with the Akron "Tork-Lok" feature.

The driver side rear discharge valve shall be controlled by a push/pull handle located on the operator's panel.

One (1) 2 1/2" NST chrome plated pressure vented cap(s) shall be installed at the driver side rear discharge.

The driver side rear discharge shall be equipped with a Class One Sub-Z II, 3 ½" diameter silicone filled pressure gauge with pulse and vibration dampening. To prevent internal freezing, the stem and Bourdon tube shall be filled with low temperature oil and be sealed from the water system using an isolating diaphragm located in the stem. A bright metal bezel shall be supplied for resistance to corrosion and to protect the lens and case from damage. The gauge face shall be white with black numerals.

DECK GUN DISCHARGE

A deck gun discharge shall be plumbed from the pump to an area on top of the vehicle. The deck gun piping shall be firmly supported and braced.

The deck gun discharge shall be located in the dunnage area above the pump module on the officer's side of the vehicle. A pedestal type, 1/4" steel plate support assembly shall be provided to stabilize deck gun plumbing below deck gun mount flange.

The deck gun discharge pipe shall terminate with 3" NPT threads.

The deck gun piping shall be designed so the overall height of the deck gun in the mounted/stowed position does not exceed the tallest point on the cab/body.

The deck gun discharge shall be plumbed utilizing 3" schedule 40, galvanized piping, 45 degree threaded elbows and a limited number of 90 degree sweep elbows in an assembly from the pump to the deck gun location.

A minimum of one (1) grooved pipe coupling shall be furnished in this assembly to allow for flex and serviceability.

A 3" Akron, #8800 series, full flow, stainless steel ball valve shall be provided for the deck gun discharge. The valve shall be equipped with the Akron "Tork-Lok" feature.

The deck gun discharge valve shall be controlled by a push/pull handle located on the operator's panel.

The deck gun discharge shall be equipped with a Class One Sub-Z II, 3 ½" diameter silicone filled pressure gauge with pulse and vibration dampening. To prevent internal freezing, the stem and Bourdon tube shall be filled with low temperature oil and be sealed from the water system using an isolating diaphragm located in the stem. A bright metal bezel shall be supplied for resistance to corrosion and to protect the lens and case from damage. The gauge face shall be white with black numerals.

ELKHART DECK GUN & FLANGE

A 8297-25 Elkhart Deck Gun and 8298 Flange will be provided and installed

FRONT DISCHARGE

A 2 1/2" front #1 discharge shall be plumbed to the front bumper of the vehicle.

The front #1 discharge shall terminate on the top center of the front bumper extension gravel shield with a chrome 2 1/2" NSTM chicksan swivel adapter.

The front #1 discharge shall be plumbed utilizing 2 1/2" schedule 40, galvanized piping, 45 degree threaded elbows and a limited number of 90 degree sweep elbows in an assembly from the pump to the front of the vehicle.

A minimum of one (1) grooved pipe coupling shall be furnished in this assembly to allow for flex and serviceability. Automatic discharge drains shall be provided at all low points in the plumbing.

A 2 1/2" Akron, #8800 series, full flow, stainless steel ball valve shall be provided for the front #1 discharge. The valve shall be equipped with the Akron "Tork-Lok" feature.

The front #1 discharge valve shall be controlled by a push/pull handle located on the operator's panel.

A 2 1/2" NST chrome plated pressure vented cap shall be installed the front #1 discharge.

The front #1 discharge shall be equipped with a 2 ½ " diameter Noshok pressure gauge. The gauge shall have a rugged corrosion free stainless steel case and clear scratch resistant molded crystals with captive O-ring seals to ensure distortion free viewing and seal the gauge. The gauge shall be filled with a synthetic mixture to dampen shock and vibration, lubricate the internal mechanisms, prevent lens condensation and ensure proper operation from –40°F to +160°F.

The gauge shall exceed ANSI B40.1 Grade A requirements with an accuracy of +/- 1.5% full scale and include a size appropriate phosphorous bronze bourdon tube with a reinforced lap joint and large tube base to increase the tube life and gauge accuracy.

A polished chrome-plated stainless steel bezel shall be provided to prevent corrosion and protect the lens and gauge case. The gauge shall have black graphics on a white background.

HORIZONTAL CROSSLAY #1

A crosslay hose bed shall be provided and plumbed from the pump in a transverse design, located above the pump enclosure for quick attack deployment. The crosslay hose bed flooring shall be designed to be removable, constructed from brushed finish, perforated aluminum material.

Crosslay #1 shall be designed to have a minimum total capacity of 3.5 cubic feet as required by NFPA -1901 to accommodate a minimum of 200 feet of 2 1/2" fire hose.

Crosslay #1 hosebed shall be designed to accommodate the fire hose in a double stack configuration.

The crosslay discharge shall terminate below the hosebed floor with a 2 1/2" NSTM chicksan swivel adapter. The crosslay hose bed floor shall be slotted to allow the swivel to extend up through the floor, allowing the pre-connected hose to be pulled off either side of the apparatus without kinking the hose at the coupling connection.

The crosslay #1 discharge shall be plumbed utilizing 2 1/2" schedule 40, galvanized piping and/or flexible hose, 45 degree threaded elbows and a limited number of 90 degree sweep elbows in an assembly from the pump to crosslay hosebed.

A minimum of one (1) grooved pipe coupling shall be furnished in this assembly to allow for flex and serviceability.

A 2 1/2" Akron, #8800 series, full flow, stainless steel ball valve shall be provided for the crosslay #1 discharge. The valve shall be equipped with the Akron "Tork-Lok" feature.

The crosslay #1 discharge valve shall be controlled by a push/pull handle located on the operator's panel.

The crosslay #1 discharge shall be equipped with a Class One Sub-Z II, 3 ½" diameter silicone filled pressure gauge with pulse and vibration dampening. To prevent internal freezing, the stem and Bourdon tube shall be filled with low temperature oil and be sealed from the water system using an isolating diaphragm located in the stem. A bright metal bezel shall be supplied for resistance to corrosion and to protect the lens and case from damage. The gauge face shall be white with black numerals.

HORIZONTAL CROSSLAY #2

A crosslay hose bed shall be provided and plumbed from the pump in a transverse design, located above the pump enclosure for quick attack deployment. The crosslay hose bed flooring shall be designed to be removable, constructed from brushed finish, perforated aluminum material.

Crosslay #2 shall be designed to have a minimum total capacity of 3.5 cubic feet as required by NFPA -1901 to accommodate a minimum of 200 feet of 2 1/2" fire hose.

Crosslay #2 hosebed shall be designed to accommodate the fire hose in a double stack configuration.

The crosslay discharge shall terminate below the hosebed floor with a 2 1/2" NSTM chicksan swivel adapter. The crosslay hose bed floor shall be slotted to allow the swivel to extend up through the floor, allowing the pre-connected hose to be pulled off either side of the apparatus without kinking the hose at the coupling connection.

The crosslay #2 discharge shall be plumbed utilizing 2 1/2" schedule 40, galvanized piping and/or flexible hose, 45 degree threaded elbows and a limited number of 90 degree sweep elbows in an assembly from the pump to crosslay hosebed.

A minimum of one (1) grooved pipe coupling shall be furnished in this assembly to allow for flex and serviceability.

A 2 1/2" Akron, #8800 series, full flow, stainless steel ball valve shall be provided for the crosslay #2 discharge. The valve shall be equipped with the Akron "Tork-Lok" feature.

The crosslay #2 discharge valve shall be controlled by a push/pull handle located on the operator's panel.

The crosslay #2 discharge shall be equipped with a Class One Sub-Z II, 3 ½" diameter silicone filled pressure gauge with pulse and vibration dampening. To prevent internal freezing, the stem and Bourdon tube shall be filled with low temperature oil and be sealed from the water system using an isolating diaphragm located in the stem. A bright metal bezel shall be supplied for resistance to corrosion and to protect the lens and case from damage. The gauge face shall be white with black numerals.

HORIZONTAL SPEEDLAY #1

Speedlay #1 shall be a transverse hose bed, which shall be designed as an integral part of the

pump module design, located forward of the pump just above the frame rails. Hose deployment shall be accomplished from either side of the apparatus. The speedlay hose bed flooring shall be designed to be removable, constructed from brushed finish, perforated aluminum material.

SPEEDLAY #1 SLIDE-OUT TRAY

A 3/16" aluminum, three (3) sided, "J" shaped slide out tray shall be provided for speedlay #1 to allow easy loading of the hose off the vehicle. The tray shall be designed to slide out from either side of the vehicle. The sides and floor of the opening shall be lined with Nylatron to assist in the loading of the tray.

The tray shall have a cut out on each side of the tray so it may be used as a handle to remove the tray. The handle area shall extend passed the side panel on each end of the tray to allow removal of the tray without getting fingers caught in the latch tray mechanism.

A cadmium plated thumb type latches shall be provided for the tray to secure the tray in the speedlay opening.

The speedlay #1 discharge shall terminate through the rear wall of the hosebed with a 2 1/2" NSTM chicksan swivel adapter. The hosebed rear wall shall be slotted at the top to allow the swivel to through the wall, allowing the pre-connected hose to be pulled off either side of the apparatus without kinking the hose at the coupling connection.

Speedlay #1 shall be designed to have a minimum total capacity of 3.5 cubic feet as required by NFPA -1901 to accommodate a minimum of 200 feet of 2 1/2" fire hose. The hose shall be loaded in a triple stack configuration.

The speedlay #1 discharge shall be plumbed utilizing 2 1/2" schedule 40, galvanized piping and/or flexible hose, 45 degree threaded elbows and a limited number of 90 degree sweep elbows in an assembly from the pump to speedlay hosebed.

A minimum of one (1) grooved pipe coupling shall be furnished in this assembly to allow for flex and serviceability.

A 2 1/2" Akron, #8800 series, full flow, stainless steel ball valve shall be provided for the speedlay #1 discharge. The valve shall be equipped with the Akron "Tork-Lok" feature.

The speedlay #1 discharge valve shall be controlled by a push/pull handle located on the operator's panel.

The speedlay #1 discharge shall be equipped with a 2 ½ “ diameter Noshok pressure gauge. The gauge shall have a rugged corrosion free stainless steel case and clear scratch resistant molded crystals with captive O-ring seals to ensure distortion free viewing and seal the gauge. The gauge shall be filled with a synthetic mixture to dampen shock and vibration, lubricate the internal mechanisms, prevent lens condensation and ensure proper operation from –40°F to +160°F.

The gauge shall exceed ANSI B40.1 Grade A requirements with an accuracy of +/- 1.5% full scale and include a size appropriate phosphorous bronze bourdon tube with a reinforced lap joint and large tube base to increase the tube life and gauge accuracy.

A polished chrome-plated stainless steel bezel shall be provided to prevent corrosion and protect the lens and gauge case. The gauge shall have black graphics on a white background.

HORIZONTAL SPEEDLAY #2

Speedlay #2 shall be a transverse hose bed, which shall be designed as an integral part of the pump module design, located forward of the pump just above the lower speedlay. Hose deployment shall be accomplished from either side of the apparatus. The speedlay hose bed flooring shall be designed to be removable, constructed from brushed finish, perforated aluminum material.

SPEEDLAY #2 SLIDE-OUT TRAY

A 3/16" aluminum, three (3) sided, "J" shaped slide out tray shall be provided for speedlay #2 to allow easy loading of the hose off the vehicle. The tray shall be designed to slide out from either side of the vehicle. The sides and floor of the opening shall be lined with Nylatron to assist in the loading of the tray.

The tray shall have a cut out on each side of the tray so it may be used as a handle to remove the tray. The handle area shall extend passed the side panel on each end of the tray to allow removal of the tray without getting fingers caught in the latch tray mechanism.

A cadmium plated thumb type latches shall be provided for the tray to secure the tray in the speedlay opening.

The speedlay #2 discharge shall terminate through the rear wall of the hosebed with a 2 1/2" NSTM chicksan swivel adapter. The hosebed rear wall shall be slotted at the top to allow the swivel to through the wall, allowing the pre-connected hose to be pulled off either side of the apparatus without kinking the hose at the coupling connection.

Speedlay #2 shall be designed to have a minimum total capacity of 3.5 cubic feet as required by NFPA -1901 to accommodate a minimum of 200 feet of 2 1/2" fire hose. The hose shall be loaded in a triple stack configuration.

The speedlay #2 discharge shall be plumbed utilizing 2 1/2" schedule 40, galvanized piping and/or flexible hose, 45 degree threaded elbows and a limited number of 90 degree sweep elbows in an assembly from the pump to speedlay hosebed.

A minimum of one (1) grooved pipe coupling shall be furnished in this assembly to allow for flex and serviceability.

A 2 1/2" Akron, #8800 series, full flow, stainless steel ball valve shall be provided for the speedlay #2 discharge. The valve shall be equipped with the Akron "Tork-Lok" feature.

The speedlay #2 discharge valve shall be controlled by a push/pull handle located on the operator's panel.

The speedlay #2 discharge shall be equipped with a 2 ½ " diameter Noshok pressure gauge. The gauge shall have a rugged corrosion free stainless steel case and clear scratch resistant molded crystals with captive O-ring seals to ensure distortion free viewing and seal the gauge. The gauge shall be filled with a synthetic mixture to dampen shock and vibration, lubricate the internal mechanisms, prevent lens condensation and ensure proper operation from –40°F to +160°F.

The gauge shall exceed ANSI B40.1 Grade A requirements with an accuracy of +/- 1.5% full scale and include a size appropriate phosphorous bronze bourdon tube with a reinforced lap joint and large tube base to increase the tube life and gauge accuracy.

A polished chrome-plated stainless steel bezel shall be provided to prevent corrosion and protect the lens and gauge case. The gauge shall have black graphics on a white background.

PUMP ENCLOSURE HOSEBED HOSE RETENTION

A vinyl cross lay cover shall be provided. It shall be securely fastened at the front with snaps and Velcro at the rear, with straps to secure each end flap.

The crosslay cover shall be red in color.

SPEED LAY HOSEBED HOSE RETENTION

Vinyl coated polyester covers shall be provided on each side of the speed lays to retain hose in the speed lays. The covers shall be secured with expandable loops sewn into the covers and hooks on the apparatus.

The speed lay end flap shall be red in color.

OFFICER SIDE WELL DISCHARGE

A 1-1/2" discharge shall be plumbed to the officer side lower pump panel.

The officer side storage well discharge shall terminate with a chrome 1 1/2" NPSH chicksan swivel adapter in the officer side storage well.

A discharge shall be plumbed utilizing 2" schedule 40, galvanized piping in an assembly from the pump to the officer side well storage of the vehicle.

A 2" Akron, #8800 series, full flow, stainless steel ball valve shall be provided for the officer side well storage discharge. The valve shall be equipped with the Akron "Tork-Lok" feature.

An officer side well storage discharge valve shall be controlled by a push/pull handle located on the operator's panel.

A 1 1/2" NST chrome plated pressure vented cap shall be installed the officer side storage well discharge.

The officer side storage well discharge shall be equipped with a Class One 3 1/2" pressure gauge which shall contain a vibration dampened internal mechanism. To prevent internal freezing, the stem and Bourdon tube shall be filled with low temperature oil and be sealed from the water system using an isolating diaphragm located in the stem. A bright metal bezel shall be supplied for resistance to corrosion and to protect the lens and case from damage.

The pressure gauge shall be illuminated internally using light emitting diodes, which shall be wired through the pump panel light circuit. The gauge face shall be white with black numerals.

The color of the illuminated Class One gauge shall be Red.

****** PUMP PANEL & ACCESSORIES *******
PUMP PANEL - TOP MOUNT

The pump operator's control panel shall be located above the pump towards the rear of the transverse walkway area with the operator facing the rear of the apparatus to operate the pump controls.

The top and side panels shall be completely removable and designed for easy access and servicing.

TOP MOUNT GAUGE PANEL

The top operator's panel shall be fabricated from 14-gauge 304L stainless steel with a #4, (150/180 grit), standard polished finish.

SIDE PUMP PANEL MATERIAL

The left and right side pump panel shall be fabricated from 14-gauge 304L stainless steel with a #4, (150/180 grit), standard polished finish.

HINGED PUMP ACCESS DOOR DRIVER SIDE

An 18" high by a minimum 30" wide pump enclosure access door shall be provided, one (1) above the driver's side pump panel. The door shall have a "D" two point latch mechanism and two (2) gas shock stay arms for ease of access.

HINGED PUMP ACCESS DOOR OFFICER SIDE

An 18" high by a minimum 30" wide pump enclosure access door shall be provided, one (1) above the officer's side pump panel. The door shall have a "D" two point latch mechanism and two (2) gas shock stay arms for ease of access.

PANEL FASTENERS

Stainless steel machine screws and lock washers shall be used to hold these panels in position. The panels shall be easily removable to provide complete access to the pump for major service.

CAPS AND ADAPTERS SAFETY TETHER

All applicable discharge and suction caps, plugs and adapters shall be equipped with chrome plated ball chain or double looped coil chain and secured to the vehicle.

PUMP PANEL TRIM PLATES

A high polish stainless steel trim plate shall be provided around each discharge port and suction inlet opening to allow accessibility to the respective valve for service and repairs.

DISCHARGE GAUGE TRIM BEZELS

Each individual discharge gauge shall be installed into a decorative chrome-plated mounting bezel that incorporates valve-identifying verbiage and color labels.

COLOR CODED IDENTIFICATION TAGS

Color coded identification tags shall be provided for all gauges, controls, connections, switches, inlets and outlets.

PUMP OPERATOR'S PANEL LIGHT SHIELD

The pump operators panel shall be equipped with a light shield that shall be full width of the control panel, and shall be positioned to cover the lights and prevent glare.

The light shield shall be equipped with the following lights:

Amdor Luma Bar H2O super bright led strip lights

DRIVER SIDE PUMP PANEL LIGHTING

The driver side pump panel and running board shall be illuminated by the following lights:

- Two (2) Weldon #9186 halogen shielded step lights

The lights shall be switched with the top mount panel lights.

TOP MOUNT WALKWAY LIGHTING

The top mount walkway shall be illuminated by the following lights:

- Four (4) Whelen #OAC0EDCR 45 degree LED illumination lights

The lights shall be controlled with the marker lights.

OFFICER SIDE PANEL LIGHTING

The officer's side pump panel and running board shall be illuminated by the following lights:

- Four (4) Whelen #OAC0EDCR 45 degree LED illumination lights

The lights shall be switched with the main pump panel lights.

PUMP OPERATOR'S PANEL

Particular attention is to be given to functional arrangement of all controls. The pump operator's panel shall accommodate the following:

- Hinged gauge panel
- Water tank fill valve
- Auxiliary suction valve control
- All discharge valve controls
- Auxiliary engine cooler controls
- Water tank suction control valve
- Pump primer valve
- Engine throttle control
- Master compound vacuum gauge
- Master pressure gauge
- Individual discharge gauges
- Pump shift engaged indicator light
- Water tank water level indicator
- Engine tachometer
- Engine oil pressure gauge with audible alarm
- Engine water temperature gauge with audible alarm
- Low voltage light and audible alarm
- Pump panel light switch

- Speed counter (Underwriters)
- Pump performance plate (Underwriters)
- Pump serial No. plate
- Master pump drain valve
- Individual drains
- Voltmeter
- Air inlet/outlet at lower driver side panel
- Relief valve with indicator light
- Relief valve drains
- Pump panel air horn actuation button, directly adjacent to this button will be a switch to operate the generator.
- Fire research "ThrottleXcel" throttle control
- Waterous pressure relief valve control

PUMP TEST PORTS

The pump panel shall be equipped with Vacuum & Pressure test plugs to allow for test equipment to monitor pump pressure and vacuum levels. Chrome plugs and labels shall be provided for the test ports.

MASTER GAUGES

One (1) 4" diameter pressure gauge (labeled: "PRESSURE") and one (1) 4" diameter compound vacuum gauge (labeled: "INTAKE") shall be provided. The master gauges shall be "No Shok"**,** silicone filled. The gauge faces shall be white with black numerals.

PRESSURE & COMPOUND GAUGE RANGES

All applicable pressure gauges shall have a range of 0 - 400 P.S.I., and the compound gauge shall have a range of -30" - 0 - 400 P.S.I.

FIRE RESEARCH "THROTTLEXCEL"

THROTTLE CONTROL AND MONITORING DISPLAY

The apparatus shall be equipped with a Fire Research ThrottleXcel model ELA200-A00 engine throttle and monitoring display shall be installed. The control module case shall be waterproof and have dimensions not to exceed 6 3/4" high by 4 5/8" wide by 1 1/2" deep. The control knob shall be 2" in diameter with no mechanical stops, have a serrated grip, and a red idle push button in the center. It shall not extend more than 1 3/4" from the front of the control module. Inputs for monitored information shall be from a J1939 databus or independent sensors. Outputs for engine control shall be on the J1939 databus or engine specific wiring.

The engine RPM shall be set to idle when the pump engaged interlock signal is recognized regardless of the throttle control knob position. Optical technology shall be used to detect the direction and speed that the control knob rotated for RPM control.

The following continuous displays shall be provided:

- Engine RPM; shown with four daylight bright LED digits more than 1/2" high
- Check engine and stop engine warning LEDs
- Oil pressure; shown on a dual color (green/red) LED bar graph display

- Engine coolant temperature; shown on a dual color (green/red) LED bar graph display
- Transmission Temperature: shown on a dual color (green/red) LED bar graph display
- Battery voltage; shown on a dual color (green/red) LED bar graph display
- Interlock; OK TO PUMP LED is green to indicate throttle ready.

A dot-matrix message display shall show diagnostic and warning messages as they occur. It shall show monitored apparatus information, stored data, and program options when selected by the operator. Operator selections and inputs shall be via push buttons on the front panel.

The program shall store the accumulated operating hours for the pump and engine, previous incident hours, and current incident hours in a non-volatile memory. Stored elapsed hours shall be displayed at the push of a button. The program shall have calibration and self-diagnostic capabilities. It shall monitor inputs and support audible and visual warning alarms for the following conditions:

- Low Oil Pressure
- High Engine Coolant Temperature
- High Transmission Temperature
- Low Battery Voltage (Engine Off)
- Low Battery Voltage (Engine Running)
- High Battery Voltage
- High Engine RPM

The program features shall be accessed via push buttons located on the front of the control module. There shall be a USB port located at the rear of the control module to upload future firmware enhancements.

ENGINE COOLER

An auxiliary cooler or heat exchanger shall be installed in the engine compartment between the engine and the chassis radiator. The cooler shall permit the use of water from the pump for cooling system. The cooling shall be done without mixing engine and pump water.

TANK LEVEL GAUGE

A Fire Research, model #WLA200-A00, "TANKVISION" gauge that shows the actual volume of water in the tank shall be provided on the pump operator's panel. The "TANKVISION" gauge is designed for both ease of operation and installation. The "TANKVISION" gauge utilizes ultra bright LEDs for sunlight readability and also uses 2 specially designed wide-viewing lens for 180° of clear viewing. The "TANKVISION" gauge utilizes a pressure sender to measure the liquid volume. The gauge shall be equipped self-calibration feature allows the LED's TANKVISION gauge to be used on tanks of different shapes and sizes.

Features:

- Flashes warning when the volume is less than 25%. Rapid down scrolling LED's alert the operator when the tank is almost empty. Remote audio warning available
- One size fits all'. The self-calibration feature allows for easy calibration of any shape or size tank
- Multiple displays are possible with a single sender through the FRC data bus
- Rugged waterproof cast aluminum housing
- No fitting needed for poly tank.
- Special fittings available for other tank materials.

- Connector disconnects at back of display

The gauge shall use a pressure transducer installed near the bottom of the water tank to determine the correct volume in the tank.

A Fire Research model #WLA290, remote relay module shall be provided to provide outputs for large indicator lights on the side of the vehicle.

LARGE LIGHT WATER LEVEL GAUGE, EACH SIDE OF CAB

A large light water level gauge system shall be provided on both sides of the cab. Each side shall be provided with a Whelen model PSTANK, LED strip light mounted behind the rear crew door above the handrail. The lights shall be surface mounted on the sides of the cab.

The lights shall be mounted as to indicate the following water levels:

- Top light with green lens — Full tank
- Second light with blue lens — 3/4 tank
- Third light with amber lens — 1/2 tank
- Fourth light with red lens — 1/4 tank

The fourth light shall burn steady red to indicate 1/4 tank and shall start to flash when the water level drops below 1/4 tank. To prevent distraction to drivers, this tank level gauge shall be wired to display only when the park brake is engaged.

WATER TANK

The water tank shall have a capacity of 750 gallons, constructed from Poly material.

TANK CONSTRUCTION

The Poly water tank shall be constructed from 1/2" thick polypropylene sheet stock. This material shall be a non corrosive stress relieved thermo-plastic, natural in color, and U.V. stabilized for maximum protection.

The water and foam tanks shall be of a specific configuration and shall also designed to be completely independent of the body and compartments. All joints and seams shall be nitrogen welded and tested for maximum strength and integrity. The top of the booster tank shall be fitted with removable lifting eyes designed with a 3 to 1 safety factor to facilitate easy removal. The transverse swash partitions shall be manufactured of 3/8" polypropylene (natural in color) and extend from approximately 4" off the floor to just under the cover. The longitudinal swash partitions shall be constructed of 3/8" polypropylene (natural in color) and extend from the floor of the tank through the cover to allow for positive welding and maximum integrity. All partitions shall be equipped with vent and air holes to permit movement of air and water between compartments. The partitions shall be designed to provide maximum water flow. All swash partitions interlock with one another and are welded to each other as well as to the walls of the tank.

TANK LID

The tank cover shall be constructed of 1/2" thick polypropylene, natural in color, and U.V. stabilized, to incorporate a multi three-piece design, which allows for individual removal and inspection if necessary. The tank cover shall be recessed 3/8" from the top of the tank and shall be welded to both sides and longitudinal partitions for maximum integrity. Each one of the covers shall have hold downs

consisting of 2" polypropylene dowels spaced a maximum of 30" apart. These dowels shall extend through the covers and become welded to the transverse partitions. This shall assist in keeping the cover rigid under fast filling conditions. A minimum of two lifting dowels shall be drilled and tapped 1/2" X 13" to accommodate the lifting eyes.

TANK FILL TOWER

The tank shall have a combination vent and manual fill tower. The fill tower shall be constructed of 1/2" polypropylene and shall be a minimum dimension of 8" x 8" outer perimeter. The tower shall be located in the left front corner of the tank unless otherwise specified be the purchaser in Special Provisions. The tower shall have a 1/4" thick removable polypropylene screen and a polypropylene hinged type cover. The fill tower cover shall be marked as a water tank fill point.

OVERFLOW AND VENT PIPE

The fill tower shall be fitted with an integral 4" I.D. schedule 40 P.V.C. combination overflow/vent pipe running from the fill tower through the tank to a 4" coupling flush mounted into the bottom of the tank to allow water to overflow behind the chassis rear axle.

TANK SUMP

The tank sump shall be a minimum of 10" wide x 10" long x 3" deep. An anti-swirl plate shall be mounted inside the sump, approximately 1" above the bottom of the sump.

A 3" drain plug shall be provided.

OUTLETS

There shall be two (2) standard tank outlets; one for tank-to-pump suction line which shall be a minimum of 4" coupling and one for a tank fill line which shall be a minimum of a 2" N.P.T. coupling. All tank fill couplings shall be backed with flow deflectors to break up the stream of water entering the tank.

TANK MOUNTING

The tank shall rest on the body cross members spaced a maximum of 22" apart, and shall be insulated from these cross members with a minimum of 3/8" nylon webbing or 1/2" rubber, 2-1/2" wide. The tank shall sit cradle-mounted using four (4) corner angles of 6 x 6 x 4 x 0.250 welded directly to the body cross members. The angles shall keep the tank from shifting left to right or front to rear. The tank is designed on the free-floating suspension principle and shall not require the use of hold downs. The tank shall be completely removable without disturbing or dismantling the apparatus body structure. The body or hose bed cross braces shall act as water tank retainers.

APPARATUS BODY DESIGN CONSTRUCTION

The body side and compartment assemblies shall be designed and assembled to provide maximum strength and durability under all operating conditions.

Special attention shall be taken to minimize corrosion on all fabricated parts and structural members of the body. All bolt-on components shall be provided with a dissimilar metals isolation barrier to prevent electric corrosion. The body design shall also incorporate removable panels to access spring hangers, rear body mounts and fuel tank sending units.

The body assembly shall be an all-welded configuration. The body shall be completely isolated from the cab and pump module structure.

BODY AND COMPARTMENT FABRICATION - 3/16" ALUMINUM

All compartment panels and body side sheets shall be entirely 3/16" aluminum (5052-H32). Each side compartment assembly shall be both plug welded and stitch welded to ensure proper weld penetration on all panels while avoiding the possible warping caused by a full seam weld. The side compartments shall be welded on a fixture to ensure true body dimensions of all door openings. The side compartments and body side panels are then set into a body squaring fixture where the super structure is installed and the entire body is aligned to be completely symmetrical. The super structure is then welded to the compartment side panels and reinforcement plates are inserted which allows the compartment panels to become an integral component of the body support structure. A full seam weld shall not be used due to the applied heat which shall distort sheet metal and remove the protective coating from the perimeter of the welded area. All seams shall be caulked prior to finish paint to ensure proper compartment seal.

100" WIDE FIRE BODY

The fire body shall be 100" wide to provide the maximum amount of usable hose bed space, approximately 76" wide, and to extend the body fenderettes outward for better tire tread coverage.

SUPER STRUCTURE - ALUMINUM

The body super structure shall be an all welded configuration utilizing a combination of 3” x 1-1/2” 6061-T6 thick walled structural tubing and 6061 structural channel.

This structure shall be designed to totally support the full length and width of the body and shall be welded to the body side compartments by use of reinforcement plates to incorporate the compartments into an integral part of the body weldment.

The super structure shall be bolted to the sides of the chassis frame at four (4) points.

STEPPING, STANDING, & WALKING SURFACES

All stepping, standing, and walking surfaces on the body shall meet NFPA #1901 anti-slip standards. Aluminum tread plate utilized for stepping, standing, and walking surfaces shall be Alcoa No Slip type. This material shall be certified to meet the NFPA #1901 standard. Upon request by the Purchaser, manufacturer shall supply proof of compliance with this requirement. (There shall be No Exceptions allowed for this paragraph)

DRIVER'S SIDE COMPARTMENTATION

One (1) full height compartment shall be provided forward of the rear wheels, measuring 66" high x 49" wide with a single roll-up door opening 62" high x 46" wide.

One (1) full height compartment shall be provided to the rear of the rear wheels, measuring 66" high x 49" wide with a single roll-up door opening 62" high x 46" wide.

One (1) equipment compartment shall be provided above the rear wheels, measuring 34" high x 59" wide with a single roll-up door opening 30" high x 53" wide.

The driver's side body compartments shall be 26" deep for the full height of the compartments.

OFFICER'S SIDE COMPARTMENTATION

One (1) full height compartment shall be provided forward of the rear wheels, measuring 66" high x 49" wide with a single roll-up door opening 62" high x 46" wide.

One (1) full height compartment shall be provided to the rear of the rear wheels, measuring 66" high x 49" wide with a single roll-up door opening 62" high x 46" wide.

One (1) equipment compartment shall be provided above the rear wheels, measuring 34" high x 59" wide with a single roll-up door opening 30" high x 53" wide.

The officer's side body compartments shall be 26" deep in the lower full depth section and 12" deep in the upper section.

BODY ROOF COMPARTMENTS (DRIVER'S SIDE)

Roof hatch style compartments shall be provided the full length of the body, on the driver's side of the body hose bed area and shall be designed as an integral extension of the lower side compartments with a painted exterior finish. Drain tubes shall be provided at each end of each side compartment which shall extend down through the lower compartments.

Each side roof compartment shall extend the length of the body, which shall be evenly divided into three (3) individually accessed areas, which shall be open through from the front to the rear. The compartment depth shall extend from the ceiling area of the upper side compartments to the top of the body. The interior compartment width of each side roof compartment shall be a minimum of 23-1/2" inside width with an 20" wide access door at the top.

Each roof compartment shall be equipped with an overlapping, hinged lift up tread plate door. These doors shall be constructed of 3/16" aluminum tread plate with a 15 degree break on all sides. Each door shall have two (2) gas shock style stay open devices which shall also retain the door in the closed position. Each compartment door shall be equipped with a compartment light, a door button switch and a floor drain with a plastic tube to direct the water below the body.

Protective panels shall be applied inside the compartments to cover any exposed wiring or recessed side body lighting, provided on the unit. These panels shall reduce the overall usable compartment area in the compartments.

BODY ROOF COMPARTMENTS (OFFICER'S SIDE)

Roof hatch style compartments shall be provided the full length of the body, on the officer's side of the body hose bed area and shall be designed as an integral extension of the lower side compartments with a painted exterior finish. Drain tubes shall be provided at each end of each side compartment which shall extend down through the lower compartments.

Each side roof compartment shall extend the length of the body, which shall be evenly divided into three (3) individually accessed areas, which shall be open through from the front to the rear. The compartment depth shall extend from the ceiling area of the upper side compartments to the top of the body. The interior compartment width of each side roof compartment shall be a minimum of 23-1/2" inside width with a 20" wide access door at the top.

Each roof compartment shall be equipped with an overlapping, hinged lift up tread plate door. These doors shall be constructed of 3/16" aluminum tread plate with a 15 degree break on all sides. Each door shall have two (2) gas shock style stay open devices which shall also retain the door in the closed position. Each compartment door shall be equipped with a compartment light, a door button switch and a floor drain with a plastic tube to direct the water below the body.

Protective panels shall be applied inside the compartments to cover any exposed wiring or recessed side body lighting, provided on the unit. These panels shall reduce the overall usable compartment area in the compartments.

ROLL-UP DOORS

Roll-up doors shall be provided on all compartments. The roll-up doors shall be constructed from aluminum extruded slats which shall have a flexible seal between each slat for proper sealing of the door.

A synthetic rubber seal shall be provided at each side, top and bottom edge of the door to prevent entry of dirt into the compartment.

The door shall be equipped with a lift bar style latch mechanism which shall latch at the bottom of the door mounting extrusion.

The roll-up door assembly shall be furnished with a spring-loaded, counter balance assembly to assist in door actuation.

All running board and high side compartments shall be equipped with roll-up doors.

AMDOR ROLL-DOORS

The roll-up doors shall be Amdor brand roll-up doors. The doors and tracks shall be painted to match the required color of the fire department.

A total of one (1) painted doors shall be provided.

SWEEP-OUT COMPARTMENT FLOORS

Compartment floors shall be welded to the compartment walls and have a sweep out design for easy cleaning.

Compartments with hinged doors shall have the door opening flanges bend down to produce the sweep-out design.

Compartments with roll-up style doors shall have the external floor flange stepped down, 1/2" high x 2" deep, to produce a sealing surface for the roll-up doors below the compartment floor. The sweep out design shall also permit easy cleaning.

Compartments set on running boards, which could cause additional corrosion potential, are not acceptable.

A 90° angle door sill protector, fabricated from 18 gauge brushed finish stainless steel shall be installed on the bottom external edge of each body compartment door opening to help protect this area from paint chipping.

BEAVERTAILS

The rear body beavertail area shall be furnished with a squared off appearance to maximize the available compartment area, while providing added support to the rear step support structure. The beavertail panels shall be assembled in conjunction with the rear body corner panels, utilizing a 2" radius for the full height of the body side compartments. This assembly shall provide a vertical mounting surface for tail lights at the rear most portion of the body and additional storage space.

The inside of the beavertails shall be furnished with polished aluminum tread plate overlays.

COMPARTMENT TOPS

Compartment tops shall be covered with polished aluminum tread plate on both sides.

DRIP MOLDING

Compartment tops over all side compartments shall have a 45 degree flange formed out to provide protection against water runoff. A secondary extruded drip molding shall be provided between low compartments and auxiliary high side compartments, when auxiliary compartments are provided.

COATED FASTENERS - (NO EXCEPTIONS)

All exterior fasteners shall be coated stainless steel screws. Screw threads shall be coated with reusable, self-locking, sealing material to provide vibration resistance. Screw heads shall be coated with a sealing element to prevent galvanic corrosion between dissimilar metals. Non-coated screws shall only be provided as part of vendor supplied component installations.

COMPARTMENT LOUVERS

Ventilation between compartments to atmosphere shall be provided and located to avoid water entry into compartments.

ACCESS PANELS

Removable access panels shall be provided in all lower compartments to access spring pins, fuel tank sender, electrical junction compartment and rear body mounts.

Protective panels shall be located in the rear compartments providing access to the lights and associated wiring. The covers shall also serve as protective covers to prevent inadvertent damage to lights or wiring from tools or equipment located in the compartment.

ZICO FOLDING ROOF ACCESS LADDER

A Zico RL-2-6 Quic-Ladder, swing out & down vehicle ladder shall be provided on the right rear body corner. The ladder shall store parallel to the body. A spring loaded locking handle shall keep the ladder stored to the body. Releasing the lock shall allow the ladder to pull out to allow for climbing at a comfortable and safe angle. The ladder shall automatically latch and will not retract until the scissor lock is raised.

The standard configuration has a two-rung fold-down section and a six-rung main ladder section. All rungs are cast aluminum with a flat nonskid surface for traction and safety. Handrails shall be 1 1/4" heavy walled aluminum tubing, covered between rungs by a ribbed black neoprene tubing, which provides a firm gripping surface.

REAR BODY PANEL

The rear body panel shall be fabricated from a minimum of 3/16" polished aluminum tread plate and shall extend the full width between the beavertails. This panel shall be full height from the rear step to the hose bed floor. The panel shall be bolted on and removable, with no part of the rear panel attached to the booster tank.

REAR STANCHIONS - CAST ALUMINUM

Two (2) Cast Products model #LB0029-1, polished stanchion brackets with wiring protectors, shall be provided at the rear of the body for upper rear warning light mounting, one (1) each side. These brackets shall be bolted to the sides of the body to minimize rear vehicle height.

BODY RUB RAILS

Sacrificial aluminum tread plate rub rails shall be mounted at the base of the body, extend outward a minimum 3/4", downward 2" and flange inward 1". The rub rails shall extend the full length of the main body and wrap around the rear body corners. Rub rails shall be designed to bolt to the body from the bottom side of the compartment area, so as not to damage the body side panels on initial impact and to provide for ease of replacement.

RUNNING BOARD STEPS

The driver and officer running board steps shall be fabricated of 3/16" polished aluminum tread plate. The outside edge on each step shall be fabricated with a double break, return flange. The steps shall be rigidly reinforced with a heavy duty support structure. The running boards shall not form any part of the compartment design, and shall be bolted into place with a minimum 1/2" clearance gap between any panel to facilitate water runoff.

OFFICER SIDE RUNNING BOARD STORAGE WELL

A storage well, constructed of 1/8" aluminum with a slatted aluminum bottom, shall be recessed into the officer’s side running board. The storage well shall measure 9" deep x 9" wide x as long as possible between the running board support members. Storage Wells shall be of pop-up construction. Drain holes shall be located in the bottom corners to allow water to drain from the storage well.

The officer's side running board hose well shall be furnished with Velcro straps to secure the hose stored in the well. The straps shall be attached to each side of the hose well with stainless steel footman loops.

DRIVER SIDE RUNNING BOARD STORAGE WELL

A storage well, constructed of 1/8" aluminum with a slatted aluminum bottom, shall be recessed into the driver’s side running board. The storage well shall measure 9" deep x 9" wide x as long as possible between the running board support members. Storage Wells shall be of pop-up construction. Drain holes shall be located in the bottom corners to allow water to drain from the storage well.

The driver's side running board hose well shall be furnished with Velcro straps to secure the hose stored in the well. The straps shall be attached to each side of the hose well with stainless steel footman loops.

REAR STEP

The rear step shall be twelve (12) inches deep, recessed between the rear portion of the rear side compartments. The step shall be fabricated from 3/16" polished aluminum tread plate, and shall be rigidly reinforced. The recessed design of the rear step shall reduce the rear side compartment depth at the rear 9 inch wide area to 12" deep with a 76" wide rear step.

The rear edge of the step shall be designed to accommodate the rear clearance lights, recessed

for protection in the step reinforcement channel. This step shall be bolted into place with a minimum 1/2" clearance gap between it and the body panel.

INTERMEDIATE REAR STEP

An eight (8) inch deep, bolt on intermediate rear step, fabricated from 3/16" aluminum tread plate, shall be installed. The step shall be approximately 8" deep x 48" wide.

ISOLATED REAR STEP COMPARTMENT

An isolated rear step compartment measuring 40" high x 46" wide x 26" deep with a door opening of 37" high x 45-1/2" wide shall be provided at the rear of the apparatus.

The rear step compartment door shall be a roll-up door. The roll-up door shall be equipped with a brushed aluminum finish.

GRAB RAILS

All hand rails shall be 1-1/4" outer diameter, knurled bright anodized aluminum extrusion, designed to meet NFPA 1901 requirements.

Molded gaskets shall be installed between the handrail stanchion castings and body surfaces to prevent electrolytic reaction between dissimilar metals and to protect paint.

GRAB RAIL LOCATIONS:

Two (2) vertical rails shall be mounted on the rear edge of the beavertails, one (1) each side.

One (1) horizontal, full width handrail shall be installed on the rear, below the level of the hose bed.

FOLDING STEPS - REAR OF BODY

Four (4) Austin Hardware model FS-200 CHR large folding steps, made of high strength die cast aluminum, with a textured chrome plate finish, minimum of 42 in^2 surface, conforming to NFPA-1901 requirements, shall be provided on the rear of the body, two (2) each side. The steps shall be mounted to accommodate access to the body hosebed area with a maximum of 18" height between each step.

SAFETY SIGN(S) AT REAR STEP AND CROSS WALKWAY(S)

Safety sign(s) shall be located on the vehicle at the rear step, and at any cross walkway(s), to warn personnel that riding in or on these areas while the vehicle is in motion is prohibited.

REAR WHEEL WELL LINERS

Fully removable, bolt-in, 1/8" aluminum fender liners shall be provided. The wheel well liners shall extend from the outer wheel well body panel, into the truck frame. Removable vertical splash shields, inward of the wheels, shall be provided to give access to the hydraulic components. The completely washable fender liners shall be designed to protect the front and rear compartments and main body supports from road salts, dirt accumulation and corrosion. Fender liners which are welded in place or are only partially removable shall not be considered.

REAR FENDERETTES

The rear fenders shall be equipped with easily replaceable, polished extruded aluminum fenderettes. The fenderettes shall be equipped with a rubber gasket molding between the body panel and the fenderette.

Fenderettes that are integrally welded to the body side panels shall not be acceptable.

DRIVER FRONT FENDER STORAGE

A storage compartment shall be inserted into the front driver side body fender. The compartment shall be sized large enough to store three (3) SCBA cylinders or fire extinguishers, with a maximum length of 26". The compartment shall have a non-abrasive lined floor area for the three (3) devices. The compartment shall be enclosed by a door painted to match the primary body color, with a single point latch and hinge. This compartment shall be tied into the compartment door ajar/do not move apparatus warning system.

OFFICER FRONT FENDER STORAGE

A storage compartment shall be inserted into the front officer side body fender. The compartment shall be sized large enough to store three (3) SCBA cylinders or fire extinguishers, with a maximum length of 26". The compartment shall have a non-abrasive floor area for the three (3) devices. The compartment shall be enclosed by a door painted to match the primary body color, with a single point latch and hinge. This compartment shall be tied into the compartment door ajar/do not move apparatus warning system.

OFFICER REAR FENDER STORAGE

A storage compartment shall be inserted into the rear officer side body fender. The compartment shall be sized large enough to store three (3) SCBA cylinders or fire extinguishers, with a maximum length of 26". The compartment shall have a rubber lined floor area for the three (3) devices. The compartment shall be enclosed by a door painted to match the primary body color, with a single point latch and hinge. This compartment shall be tied into the compartment door ajar/do not move apparatus warning system.

DRIVER REAR FENDER STORAGE

A storage compartment shall be inserted into the rear driver side body fender. The compartment shall be sized large enough to store two (2) SCBA cylinders or fire extinguishers, with a maximum length of 26". The compartment shall have a non-abrasive floor area for the two (2) devices. The compartment shall be enclosed by a door painted to match the primary body color, with a single point latch and hinge. This compartment shall be tied into the compartment door ajar/do not move apparatus warning system.

MUD FLAPS

Heavy duty mud flaps shall be provided behind the rear wheels.

REAR TOW EYES

Two (2) painted tow eyes shall be furnished on the rear of the vehicle. The tow eyes shall be made from plate steel and shall be bolted directly to the chassis frame rails with grade 8 bolts and shall extend below the body. The tow eyes shall be smooth and free from sharp edges, and have a minimum eyelet hole of 2-1/2". The tow eyes shall be painted.

WINCH RECEIVER POINT - EACH SIDE OF THE BODY

A receiver point shall be provided beneath the rub rail toward each side of the Rescue body for a portable winch. The receiver point shall be a 2 1/2" x 2 1/2" x 1/4" full width of body seamless steel tube welded and gusseted to 3" x 1 1/2" steel channel directly bolted to four points on the chassis frame rails. A 12V electrical connection with a quick disconnect compatible with the portable winch shall be provided adjacent to the receiver point. A plastic end cap shall be provided for the quick disconnect.

HOSE BED (76" WIDE)

The hose bed shall be located directly above the booster tank and shall be free from all sharp objects such as bolts, nuts, etc., to avoid damage to fire hose.

For added strength, rigidity and appearance, the hose bed side walls shall have the top edge flanged outward two (2) inches and downward one (1) inch. In a similar fashion, the top edge of the front wall shall be flanged inward two (2) inches and downward one (1) inch.

The hose bed shall provide a minimum 30 cubic feet hose storage area for 2 ½" or larger fire hose to meet NFPA 1901 minimum pumper hose storage requirement.

The apparatus weight analysis shall be based on 800' of 2 ½" hose unless otherwise specified. If the hose load to be carried exceeds this minimum, the purchaser shall advise the manufacturer prior to contract so adequate chassis carrying capacity can be provided.

HOSE BED FLOORING

Flooring to be constructed from extruded aluminum and be properly spaced for ventilation. The flooring shall be smooth and free from sharp edges to avoid hose damage. The hose bed floor shall be removable to provide access to inner body framework.

HOSE BED PARTITIONS

Two (2) fully adjustable 3/16", brushed finish, aluminum hose bed partitions shall be provided. Partitions shall be easily adjustable by means of Unistrut channels located at the front and rear of the hose bed. Partitions shall be removable for access to the booster tank.

HOSE BED CARGO NET

A hose bed cargo net shall be provided. The net shall be Black Bungee material. The net shall be secured by the customer hooking the bungee to metal hooks installed on the body top sides and body rear sheet.

Hose Bed Deflector:

A Tread Plate reinforced cover shall be installed at the front of the hose bed. The cover shall be hinged at the forward edge and gasketed on each side. A handle shall be cut through the rear center portion of the cover.

****** COMPARTMENT ACCESSORIES ******

ADJUSTABLE SHELVING

Compartment shelving shall be constructed of 3/16” brush finish aluminum with a 2” upward bend at front and rear, and side supports. Shelving shall be vertically adjustable with spring nuts in aluminum strut channel.

Adjustable shelves shall be located as follows:

Three (3) in the driver side front compartment

One (1) in the officer side front compartment

Two (2) in the driver side rear compartment

One (1) in the officer side rear compartment

One (1) in the officer side front high side compartment

One (1) in the officer side rear high side compartment

One (1) in the driver side over the wheel high side compartment

One (1) in the rear step compartment

SLIDE OUT FLOOR MOUNT SHELVING

Slide out floor mount compartment shelving shall be constructed of 3/16” brush finish aluminum with a 2" upward bend at front and rear, and side supports attached to #250 rated slides. Slide out floor mount shelving shall have gas shocks to hold the tray in and out.

Slide out floor mount shelving shall be provided as follows: In driver side rear compartment On floor forward of fixed divider.

One (1) in the driver side rear compartment

500 POUND FLOOR MOUNTED ROLL OUT TRAYS

Floor mounted roll-out trays shall consist of heavy duty, roller bearing slide tracks with an end load rating of 500 pounds, securely fastened to the compartment floor. The tray shall be fabricated from 3/16" brushed aluminum with a minimum 2" high flange on each of the four sides to assist in retaining the equipment stored on each tray. The slide tracks shall have a 70% extension.

The 500 pound floor mounted roll out trays shall be located as follows:

500 POUND FLOOR MOUNTED ROLL OUT TRAYS

Floor mounted roll-out trays shall consist of heavy duty, roller bearing slide tracks with an end load rating of 500 pounds, securely fastened to the compartment floor. The tray shall be fabricated from 3/16" brushed aluminum with a minimum 2" high flange on each of the four sides to assist in retaining the equipment stored on each tray. The slide tracks shall have a 100% extension, allowing the tray to extend out of the compartment completely.

The 500 pound floor mounted roll out trays shall be located as follows:

One (1) in the rear step compartment

ADJUSTABLE ROLL-OUT TRAY

Roll out adjustable compartment shelving shall be constructed of 3/16” brush finish aluminum with a 2” upward bend at front and rear, and side supports attached to 250# rated slides. Slide out adjustable shelving shall be vertically adjustable with spring nuts in aluminum strut channel. Slide out adjustable shelving shall have gas springs to hold in and out.

The adjustable roll-out trays shall be located as follows:

VERTICAL DIVIDERS

Full height, fixed mounted, vertical compartment dividers shall be fabricated from 3/16" brushed aluminum material. The dividers shall extend the full depth of the specified compartment from the floor to the compartment ceiling.

Full height, vertical dividers shall be located as follows:

Divider to be located in Driver Side Rear Compartment approximately 12” from rear wall. Final Location to be determined at pre-construction.

One (1) full height fixed divider(s) shall be located as directed by the fire department

SWING OUT TOOL BOARD(S)

One (1) swing out tool board(s) shall be provided and mounted as directed by the fire department. The tool board(s) shall be constructed of 3/16" smooth aluminum allowing mounting of equipment on the interior and exterior of the tool board(s). The tool boards shall be installed with a Performance Advantage Company PM-1000 Swing-Out Module Kit. Aluminum angles shall attach the hinges to Unistrut tracking to allow depth adjustments. A heavy duty thumb latch shall be provided to secure the tool board(s) in the closed position.

Location: Officer Side over the wheel well compartment

VERTICAL PULL OUT TOOL BOARD

One (1) vertical pull out tool board(s) shall be provided and mounted as directed by the fire department. The tool board(s) shall be constructed of 3/16" smooth aluminum allowing mounting of equipment on both sides of the tool board(s). The tool board shall be attached to #250 rated slides, one at the top and one at the bottom of the tool board. 3/16" aluminum angles shall attach the slides to tracking to allow horizontal adjustments. A gas shock shall be used to secure the tool board in the stored and deployed position.

Location: Driver side rear compartment to the rear of the fixed divider approximately 6”

Knox 5501 Medvault

A Knox Medvault will be provided and installed at a location to be determined at pre-build.

KNOX 2643 Key Secure System

A Knox 2643 Key Secure System will be provided and mounted at a location to be specified at pre-build..

****** 110/220 VOLT A.C. ELECTRICAL AND GENERATOR SECTION ******

120/240 VOLT ELECTRICAL SYSTEM TESTING

All line voltage wiring and permanently connected devices and equipment shall be subjected to a dielectric voltage withstand test of 900 volts for one minute. The test shall be conducted between live parts and the neutral conductor and between live parts and the vehicle frame with any switches in the circuits closed. The test shall be conducted after all bodywork has been completed. The dielectric tester shall have a minimum 500 VA transformer with a sinusoidal output voltage that can be verified.

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

OPERATIONAL TESTING

The apparatus manufacturer shall perform the following operation test and shall certify that the power source and any devices that are attached to the line voltage electrical system are properly connected and in working order.

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

The following items shall be monitored and documented every 15 minutes:

- The cranking time until the generator starts and runs.
- The voltage, frequency, and amperes at continuous full rated load.
- The generator oil pressure, water temperature, transmission temperature, hydraulic temperature, and the battery rate charge, as applicable.
- The ambient temperature and altitude.

The generator shall operate at 100 percent of its nameplate wattage for a minimum of two (2) hours.

HARRISON 10,000-WATT HYDRAULIC DRIVEN GENERATOR

One (1) Harrison Hydraulic Driven Generator model number 10.0MAS-16R rated at 10000 watts, 40/80 amps, 120/240VAC, 60 Hz, 1-phase shall be provided.

The system shall be designed and assembled by a company with no less than 10 years experience in the manufacture of hydraulic driven generators. The system shall be tested at the full nameplate load prior to shipping and be accompanied with the test report. The test report shall document the generators performance at various loads from no load to full load to ensure reliable power delivery at those loads.

The motor/generator shall be placed in a frame which affords protection to the components and provides a unitized mounting module containing the motor/generator, reservoir, oil cooler, filtration, on/off manifold containing a cross port check valve allowing unit to be started and shut down remotely.

The generator shall be a commercial type with a heavy-duty bearing and of brush less design to ensure low maintenance. No brushes or slip rings shall be allowed. The reservoir shall include an oil level sight gauge, oil temperature gauge; fill cap, oil filter, and a venturi boost unit to provide positive pressure to the pump suction port.

The generator and motor shall be close coupled and aligned using a Morse taper with a through bolt to secure the motor to the generator. No two (2) bearing generators shall be permitted.

The system must be capable of producing the full nameplate power when driven from the vehicle PTO from idle to maximum engine speed.

The generator system must be able to operate on either a Constant Engaged PTO or a Hot Shift PTO. Determination as to which PTO to use shall be made by the Fire Department. The generator must be able to be used while vehicle is either stationary or in motion.

The hydraulic motor and pump shall be of axial piston design to provide low internal leakage and a high degree of frequency stability. No gear pumps or motors shall be used. The pump shall match the system with the proper orifice, pressure compensator, and load sense settings to provide stable output regardless of engine rpm or electrical load demands.

The system shall be capable of normal operations using a commonly available ATF fluid, such as GM Dextron III or equivalent. All fluid service points shall be in close proximity to the reservoir for ease of scheduled maintenance.

When properly installed, the system shall be warranted for a period of not less than two (2) years or 2000 hours, whichever should come first.

The generator shall be able to remotely turn systems full kW on or off without regard to engine RPM by using a 12VDC switch. The switch shall be mounted as directed by the fire department.

A weatherproof digital Quadra meter containing the volt, amp, and frequency shall be installed near the breaker panel.

GENERATOR PTO

A hot shift PTO shall be provided on the transmission for the Harrison generator. The PTO shall be controlled from the cab. The control shall include a PTO engagement switch and a PTO engaged indicator light.

GENERATOR WARRANTY

The specified generator shall have a two (2) year or two thousand (2000) hour warranty as provided by the generator manufacturer. A copy of the generator warranty shall be provided at time of delivery.

The generator shall be permanently mounted in the officer side walkway storage compartment and will be equipped with perforated or louvered panels for proper ventilation.

Locating the generator greater than 144" from the main breaker panel may require the installation of an additional power disconnecting means.

LOAD CENTER

The generator output line conductors shall be wired from the generator output connections to a Square D, model #QO112L125G breaker panel. The breaker panel shall be equipped with a properly sized main breaker using two (2) of the twelve (12) spaces which leaves a total of ten (10) available spaces.

The generator output conductors shall be sized to 115% of the main breaker rating and shall be installed as indicated in the wiring section.

Ten (10) appropriately sized, 120 volt, circuit breakers shall be provided.
The breaker panel shall be located in an enclosed compartment as directed by the fire department.

WIRING METHODS

Wiring/conduit shall not be attached to any chassis suspension components, water or fuel lines, air or air brake lines, fire pump piping, hydraulic lines, exhaust system components or low voltage wiring.

All wiring shall be installed at a minimum of 12 inches away from any exhaust piping and a minimum of 6 inches from any fuel lines.

All wiring shall be securely clamped within 6 inches of any junction box and at a minimum of every 24 inches of run. All supports shall be of nonmetallic material or corrosion protected metal. All supports shall not cut or abrade conduit or cable and shall be mechanically fastened to the vehicle.

All power supply assembly conductors, including neutral and grounding conductors, shall have an equivalent amperage rating and shall be sized to carry not less than 115% of the main breaker rating.

All Type SO or Type SEO cable not installed in a compartment shall be installed in wire loom. Where Type SO or Type SEO cable penetrates a metal surface, a rubber or plastic grommet or bushing shall be provided.

The installation of all 120/240 wiring shall meet the current NFPA-1901 Standards (NO EXCEPTIONS).

WIRING IDENTIFICATION

All line voltage conductors located inside the main breaker panel box shall be individually and permanently identified. When pre-wiring for future power wiring installations, the non-terminated ends shall be labeled showing function and wire size.

GROUNDING

The neutral conductor of the power source shall be bonded to the vehicle fame only at the power source.

The grounded current carrying conductor (neutral) shall be insulated from the equipment grounding conductors and from the equipment enclosures and other grounded parts. The neutral conductor shall be colored white or gray.

In addition to the bonding required for the lower voltage return current, each body and driving/crew compartment enclosure shall be bonded to the vehicle frame by a copper conductor. The conductor shall have a minimum amperage rating of 115 percent of the name plate current rating of the power source specification label.

CIRCUIT BREAKER/RECEPTACLE INSTALLATION

The system shall be installed by highly qualified electrical technicians to assure the required level of safety and protection to the fire apparatus operators. When multiple circuit are required, the circuits shall be wired to the breaker panel in a staggered configuration to minimize electrical loads on each breaker or generator (leg) circuit. The wiring, electrical fixtures and components shall be to the highest industry quality standards available on the domestic market. The equipment shall be the type as designed for mobile type installations subject to vibration, moisture and severe continuous usage.

RECEPTACLE INSTALLATIONS

Any receptacle installed in a wet location must be a minimum of 24 inches above the ground and provided with an approved wet location cover. Wet receptacles may not be mounted at more than 45 degrees from vertical, nor can they be mounted in a face-up position.

ELECTRIC CABLE REEL

One (1) Akron Brass Model #ERWC-15-10 electric, 120 volt, electric rewind cord reel (able to accommodate 200 feet of 10 gauge or 250 feet of 12 gauge electric cable). The reel shall be provided and wired to the breaker panel. The reel shall be equipped with a universal frame that shall allow the 12 volt motor to be mounted in four different positions. The customer shall have the ability to move the motor from front to back or side to side without having to purchase extra parts. The reel shall be securely mounted and equipped with a rewind control adjacent to the reel.

Reels to be mounted one each side in the most forward position in the rooftop coffin compartments with openings through the side of body as low as possible above the roll-up doors.

The cord reel shall be mounted as directed by the fire department.

The circuit breaker used to protect any device attached to the cord reel shall be sized to the smallest electrical connection used.

ELECTRIC CABLE

Two hundred-fifty (250) feet of Type SO black 12/3 heavy duty electric cable shall be provided on the reel.

Two (2) NEMA L5-15R, 15 amp, three prong twist-lock receptacle(s) shall be provided on the end of the cable.

CABLE ROLLER ASSEMBLY

Two (2) four (4) roller assembly(s) shall be provided adjacent to each cord reel to provide un-obstructed deployment and rewinding of the cable.

Two (2) cable ball stop(s) shall be installed on the cable to keep the cable end from passing through the roller assembly.

TELESCOPING LIGHTS - ABOVE PUMP

Two (2) Kwik-Raze, model #KR-105 telescoping quartz lights shall be provided. The poles for the lights shall be heavy duty aluminum tubing that shall be secured by an aluminum mounting bracket. The lights shall be top raise type lights, which shall be securely mounted to the pump enclosure framework towards the rear of the dunnage area.

Each light shall be equipped with one (1) 500 watt 120 VAC light head. The lighting circuit for two (2) 500 watt quartz lights shall require one (1) 120V, 15 amp circuit breaker.

QUARTZ LIGHTS ABOVE PUMP SWITCHED FROM BREAKER PANEL

The quartz lights above the pump shall be wired through the circuit breaker panel and switched from the breaker panel via the circuit breakers.

LADDER STORAGE

The ground ladders shall be stored vertically next to the water tank, behind the side body compartments, on the officer side of the apparatus.

LADDERS

The following Alco-Lite ground ladder compliment shall be provided:

One (1) Alco-Lite model PEL-24; 24', aluminum, two (2) section extension ladder shall be provided.

One (1) Alco-Lite model PRL-14; 14', aluminum, straight roof ladder with folding hooks shall be provided.

One (1) Alco-Lite model FL-10; 10', folding, aluminum, attic ladder shall be provided.

****** PIKE POLES AND HOLDERS ******

ISOLATED PIKE POLE / ATTIC LADDER COMPARTMENT

A recessed compartment to accommodate two (2) 10' long pike poles and one (1) folding attic ladder shall be provided on the officer's side of the rear body panel. Aluminum storage tubes shall be provided through the body below the water tank.

SUCTION HOSE STORAGE

The suction hoses shall be located under the water tank on the officer side of the apparatus.

SUCTION HOSE

Two (2) 10 foot sections of six (6) inch PVC lightweight suction hose shall be furnished (Kochek or Firequip Maxi-Flex). Suction hose shall be for suction only and not to be used on pressurized hydrants or for relay pumping. Couplings shall include a long handle, female swivel on one end and a rocker lug male on the other end. All threads shall be six (6) inch N.S.T.

NOTE: All PVC suction hoses are strictly drafting hoses and must not be used on hydrants or in pressure applications, as serious personal injury or death may occur.

STRAINER

One (1) 6" NST barrel type strainer(s) shall be provided to attach to the suction hose. A compartment mounting bracket shall also be provided to store the strainer(s) when not in use.

HYDRANT ADAPTER

A double female swivel hydrant adapter shall be provided along with a screw base mounting bracket. One end shall attach to the suction hose and the other end to be 4-1/2" N.S.T. thread.

ADDITIONAL ITEMS SUPPLIED WITH THE VEHICLE

- 1 - Pint of touch up paint for each color
- 1 -Bag of assorted stainless steel nuts and bolts

LOOSE EQUIPMENT

The following items shall be provided and shipped loose with the completed apparatus at the time of delivery:

WHEEL CHOCKS

Two (2) ZICO #SAC-44 wheel chocks shall be mounted forward of the rear wheels on the driver side below the side running board compartments.

****** PAINT SECTION ******

PAINT, PREPARATION AND FINISH

The PPG Delta, Low V.O.C., polyurethane finishing system, or equal, shall be utilized. A "Clear Coat" paint finish shall be supplied to provide greater protection to the quality of the exterior paint finish.

All removable items, such as brackets, compartment doors, etc. shall be painted separately to insure finish paint behind mounted items. All compartment unwelded seams exposed to high moisture environments shall be sealed using permanent pliable caulking prior to finish paint.

BODY PRIMER & PREPARATION

All exposed welds shall be ground smooth for final finishing of areas to be painted. The compartments and doors are totally degreased and phosphatized. After final body work is completed, grinding (36 and 80 grit), and finish sanding shall be used in preparation for priming.

BODY FINISH PAINT

The body shall be finish sanded and prepared for final paint. Upon completion of final preparation, the body shall be painted utilizing the highest quality, state of the art, low V.O.C., polyurethane base paint. Finish paint shall be applied in multiple coats to ensure proper paint coverage with a high gloss finish.

The entire body shall be buffed and detailed.

BODY PAINT

The inside and underside of the complete body assembly shall be painted job color prior to installation of the body on the chassis or torquebox.

COMPARTMENT PAINT

The interior of the compartments shall be finish painted with Speedi Liner or equivalent material to provide a protective application over all of the compartment interior surfaces.

BODY PAINT

The body paint finish shall be PPG Delta System in a single color, to match customer furnished paint codes and requirements.

PUMP / PIPING PAINT

The pump enclosure and pump/plumbing within the pump enclosure shall be painted job color to match the primary color of the body.

CAB PRIMER & PREPARATION

The cab primer shall be a two (2) stage process. First stage shall be a coating with a two part component, self etching, and corrosion resistant primer to chemically bond the surface of the metal for increased adhesion. Second stage shall be multiple coats of a catalyzed, two component, polyurethane primer applied for leveling of small imperfections and top coat sealing.

CAB FINISH PAINT

The entire cab shall be finish sanded and prepared for final paint. Upon completion of final preparation, the cab shall be painted utilizing the highest quality, state of the art, low V.O.C., polyurethane base paint. Finish paint shall be applied in multiple coats to ensure proper paint coverage with a high gloss finish.

The cab exterior shall be painted with PPG Delta system to match purchaser's furnished paint codes. A two-tone paint finish shall be provided with the two-tone break line located approximately 3" below the cab side windows.

The entire exterior finish of the cab shall be buffed and detailed.

CAB INTERIOR PAINT

The interior metal surfaces of the cab shall be finish painted with a textured gray paint.

CHASSIS PAINT

The chassis frame rails, running gear, pump and plumbing shall be painted with Polyurethane paint to match the body color code prior to the installation of any air lines or electrical system to ensure serviceability.

WHEEL PAINT

The chassis wheels, (except polished aluminum wheels) shall be painted job color with silver trim around the perimeter.

PAINT CODES

The paint shall match customer furnished paint code(s) and layout. The paint code(s) shall be as indicated below:

- **PRIMARY PAINT COLOR**

  Single color Lower RED *Paint Code#* *TBD @ Pre-Con*

- **SECONDARY PAINT COLOR**

  Two/Tone Color: *WHITE* *Paint code#* *TBD* @ Pre-Con

TOUCH-UP PAINT

One (1) pint of each exterior color paint for touch-up purposes shall be supplied when the apparatus is delivered to the end user.

FINALIZATION & DETAILING

Prior to delivery the vehicle, the interior and exterior be cleaned and detailed. The finalization process detailing shall include installation of NFPA required labels, checking fluid levels, sealing and caulking required areas of the cab and body, rust proofing, paint touch-up, etc.

RUST PROOFING

The entire unit shall be thoroughly rust proofed utilizing rustproof and sound deadening materials applied in manufacturer recommended application procedures. Rust proofing shall be applied during the assembly process and upon completion to insure proper coverage in all critical areas.

****** LETTERING AND STRIPING ******

COMPUTER GENERATED LETTERING

The lettering and striping shall be custom designed utilizing state of the art computer software and computerized cutting machines. The manufacturer shall employ a full time artist / designer to generate all lettering, decals, and striping to meet the requirements of the Fire Department. The artwork for the lettering and striping shall be kept on record by the apparatus manufacturer to allow for ease in duplication for the Fire Department. A $5,000 Lettering Allowance has been included.

LETTERING FONT

The lettering shall be designed and cut with a basic block type font:

"BLOCK TYPE FONT"

****** NFPA REQUIRED SCOTCH-LITE STRIPING ******

SCOTCH-LITE STRIPE

A six (6) inch high "Scotch-Lite" stripe shall be provided. The stripe shall be applied on a minimum of 60 percent of each side of the unit, 60 percent on the rear of the unit and 40 percent on the front of the unit. The Scotch-Lite stripe layout shall be determined by the Fire Department.

The Scotch-Lite shall be white in color.

REAR CHEVRON STRIPING

At least 50% of the rear facing vertical surface shall be covered with alternating strips of reflective striping.

The striping shall be 6" ScotchLite.

The Scotch-Lite shall be Red and Yellow in color.

******* WARRANTIES & REQUIRED INFORMATION *******

VEHICLE WARRANTY

The proposed vehicle includes a one (1) year new vehicle warranty, upon delivery and acceptance of the vehicle. The warranty will ensure that the vehicle has been manufactured to the proposed contract specifications and will be free from defects in material and workmanship that may appear under normal use and service within the warranty period. The warranty may be subject to different time and mileage limitations for specific components and parts. This warranty is issued to the original purchaser of the vehicle.

The warranty will not apply to tires, batteries, or other parts or components that are warranted directly by their manufacturers. The warranty will not apply to routine maintenance requirements as described in the service and operators manual. No warranty whether express, implied, statutory or otherwise including, but not limited to any warranty of merchantability or fitness for purpose will be imposed.

OVERALL UNIT AND CUSTOM CHASSIS

All components and parts of the vehicle are warranted for a period of one (1) year from acceptance of the vehicle, unless excluded elsewhere in this warranty or described as having longer time limitations.

ENGINE WARRANTY

The unit will be equipped with a Fire Service rated engine, which will come furnished with a five (5) year Engine Manufacturer's warranty. A copy of the manufacturer's warranty will be supplied to define additional details of the warranty provisions.

TRANSMISSION WARRANTY

The required Allison transmission shall be provided with a five (5) year warranty. A copy of the Allison transmission warranty shall be supplied to the purchaser to define additional details of the warranty provisions.

CUSTOM CHASSIS FRAME RAILS

The proposed KME custom chassis frame and cross members will be warranted for an unlimited time period. A copy of KME's frame rail warranty will be supplied to define additional details of the warranty provisions.

CROSSMEMBERS WARRANTY

A lifetime warranty will be provided on all chassis frame cross members.

MERITOR AXLE WARRANTY

The Meritor axle/s will be provided with a two (2) year parts and labor warranty. The wheel seals, gaskets and wheel bearings will have a one (1) year warranty. A copy of Meritor's warranty will be supplied to define additional details of the warranty provisions.

CAB STRUCTURE WARRANTY

The proposed cab will be warranted against structural defects for a period of ten (10) years from the date of acceptance of the unit. Details of warranty coverage, limitations and exclusions are included in the specific warranty document.

BODY STRUCTURE WARRANTY

The proposed body will be warranted against structural defects for a period of ten (10) years from the date of acceptance of the unit. Details of warranty coverage, limitations and exclusions are included in the specific warranty document.

CORROSION WARRANTY

The proposed cab and body will be warranted against rust-through or perforation, due to corrosion from within, for a period of ten (10) years. Perforation is defined as a condition in which an actual hole occurs in a sheet metal panel due to rust or corrosion from within. Surface rust or corrosion caused by chips or scratches in the paint is not covered by this warranty.

PAINT FINISH WARRANTY

The proposed paint finish will be warranted for a period of ten (10) years from the date of acceptance of the unit. Details of warranty coverage, limitations and exclusions are included in the specific warranty document.

WATER TANK (LIFETIME)

The proposed water tank will be warranted by the water tank manufacturer for the "Lifetime" of the unit. A copy of the manufacturer's warranty will be supplied to define additional details of the warranty provisions.

WATEROUS FIRE PUMP Limited Standard Warranty

Waterous Products, Incorporated ("Waterous") hereby warrants to the original buyer that products manufactured by Hale are free of defects in material and workmanship for a period of five (5) years from the date product is first placed into service or five and one-half (5 1/2) years from date of shipment by Hale, whichever period shall be first to expire. Within this warranty period Hale will cover parts and labor for the first two (2) years and parts only for years three (3) through five (5).

AGREEMENT OF SALE FOR FIRE APPARATUS

THIS AGREEMENT is made between Kovatch Mobile Equipment Corp., t/a KME Fire Apparatus, of One Industrial Complex, Nesquehoning, Pennsylvania, ("Company") and:

City of Westfield Fire Department,of
Legal Name of Buyer

17535 Dartown Road, Indianpolis, Hamilton County, IN 46074
Address City County State Zip

(317) 804-3333
"*Buyer*" *Phone Number*

BUYER INFORMATION (check one):

Municipal Corporation ☒ Non-Profit Corporation ☐

Business Corporation ☐ Sole Proprietorship ☐

Other (specify): _____

State of Incorporation: _____ Date of Incorporation:_____

1. ACCEPTANCE: Company agrees to sell and Buyer agrees to purchase the fire apparatus ("Apparatus") described in the Specifications incorporated as Exhibit A of this contract, as may be amended in writing, and the equipment listed herein, all in accordance with the terms and conditions set forth herein.

2. DELIVERY SCHEDULE: The Apparatus shall be ready for delivery F.O.B. Westfield, IN - 270 after reciept of pre-con acceptance letter at approximately ____ days after receipt of ☐ Contract ☐ Chassis subject to extension due to changes made by Buyer or in accordance with Sections 5 or 12 below.

3. PRICE: Buyer shall pay to Company as the Purchase Price for the Apparatus the sum of ____ U.S. Dollars ($482,980.00)

This purchase price includes the following taxes:

$0.00

Any applicable taxes not specifically noted above will be paid by the Buyer directly, or will be added to the Purchase Price and paid by Company. If Buyer claims exemption from any tax, Buyer agrees to promptly furnish the applicable exemption certificate(s) and to indemnify and save Company harmless from any such tax, interest or penalty, which may at any time be assessed against Company as a result of this transaction.

4. <u>TERMS OF PAYMENT</u>: Terms of payment shall be:

(A) Due upon signing……..._____

Due upon completion/receipt of chassis..._____

Due upon delivery..... <u>$482,980.00</u>

(B) Check applicable method of payment for remaining balance due:

☒ Cash/cash equivalent at time of delivery

☐ Installment Sales Contract - Financing*

☐ Lease-Purchase Agreement - Financing*

* Lender/Leasing Company:_____

(C) No payment of any amount due under this Agreement shall be made directly to a KME Sales Representative without prior written approval from Company.

5. <u>CONTINGENCIES</u>: Company will not be liable for any delay, failure to make delivery, or other default due to strikes or labor unrest, war, riot, federal, state or local government action, fire, flood or other disaster or acts of God, accidents, breakdown of machinery, lack of or inability to obtain materials, parts or supplies, or any other causes or circumstances beyond the reasonable control of Company which prevent or hinder Company's manufacture and/or delivery of the Apparatus.

6. <u>WARRANTY</u>: Company provides a limited warranty on new Apparatus of its own manufacture in accordance with the warranty terms set forth in the Specifications.

EXCEPT TO THE EXTENT PROHIBITED BY LAW, COMPANY MAKES NO OTHER WARRANTY, EXPRESS OR IMPLIED, INCLUDING THE IMPLIED WARRANTIES OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE. THERE ARE NO WARRANTIES WHICH EXTEND BEYOND THE FACE HEREOF.

SEE SEPARATE WARRANTY STATEMENT(S) FOR COMPLETE INFORMATION.

7. <u>DISCLAIMER OF CONSEQUENTIAL DAMAGES</u>: COMPANY EXPRESSLY DISCLAIMS ANY LIABILITY FOR CONSEQUENTIAL OR INCIDENTAL DAMAGES WHICH MAY BE SUSTAINED BY BUYER, INCLUDING BUT NOT LIMITED TO THOSE ARISING FROM THE USE, INABILITY TO USE, MAINTENANCE OR REPAIR OF THE APPARATUS, WHETHER UNDER THEORIES OF BREACH OF EXPRESS OR IMPLIED WARRANTY, NEGLIGENCE, STRICT LIABILITY, OR OTHERWISE.

8. CANCELLATION: This contract is not subject to cancellation by Buyer, unless for material breach by Company, except upon payment to Company of reasonable cancellation charges, which shall take into account expenses already incurred and commitments made by Company and Company's anticipated profit.

9. ENTIRE AGREEMENT; AMENDMENTS: This contract, including its appendices, embodies the entire understanding between the parties relating to the subject matter contained herein and merges all prior discussions and agreements between them. No agent or representative of Company has authority to make any representations, statements, warranties or agreements not herein expressed. All modifications or amendments of this contract, including the appendices, and Change Orders, must be in writing signed by an authorized representative of each of the parties hereto.

10. SEVERABILITY: If any provision hereof shall for any reason be held to be invalid, illegal or unenforceable in any respect, such invalidity, illegality or unenforceability shall not affect any other provision, and this contract shall be construed as if the invalid, illegal or unenforceable provision had never been contained in it, unless to do so clearly negates the overall intent or purpose of the parties in entering into this contract.

11. CHANGES IN COMMERCIAL SPECIFICATIONS: Specifications for all commercial components of the Apparatus, manufactured by companies other than KME, are subject to change without notice. Specifications for such components will be as available at the time of manufacture of the Apparatus. Company shall not be liable for any specification deviations from the original contract specifications on such components made by their original manufacturer.

12. CHANGES IN REGULATIONS/INDUSTRY STANDARDS: The Purchase Price is subject to adjustment for changes to the Apparatus necessitated by changes in applicable government regulations (such as FMVSS or emissions regulations), industry standards (such as NFPA standards), replacement of discontinued models or components from vendors, or freight charges. Buyer is responsible for any cost increases due to such changes beyond Company’s control.

EXPLANATION OF CONTRACT AMOUNT

BASE BID PRICE: _____

OPTIONS:

FINAL CONTRACT PRICE WITH OPTIONS:

IN WITNESS WHEREOF, Buyer and Company have caused this Agreement to be executed by their duly authorized representatives this _____ day of _____, 200_.

_____
(Buyer's Legal Name)

By: _____ By: _____
Signature Signature

Title:_____ Title:_____

By: _____ By: _____
Signature Signature

Title:_____ Title:_____

Sales Representative: _____

Organization Name**:** _____

By: _____
Signature
Title: _____

This contract is not a valid and binding obligation until approved, dated and executed by Kovatch Mobile Equipment Corp., Nesquehoning, Pennsylvania.

ACCEPTED AND APPROVED BY KOVATCH MOBILE EQUIPMENT CORP.:

By: _____

Title: _____

Date: _____

FEDERAL EXCISE TAX EXEMPTION CERTIFICATE

(For use by United States, Territories, District of Columbia, or Political subdivisions.)

Date: _____

The undersigned hereby certifies that he is:

_____of _____
(Title of Officer) (United States, States, Territory, District of Columbia or Political Subdivision)

and that he is authorized to execute this certificate and that the article or articles specified in the accompanying order or on the reverse side hereof are purchased from Kovatch Mobile Equipment Corporation, for the exclusive use of

_____
(United States, States, Territory, District of Columbia, or political subdivision.)

It is understood that the exemption from tax in the case of sales or articles under this exemption certificate to the United States, States, etc. is limited to the sale of articles purchased for their exclusive use; and it is agreed that, if articles purchased tax free under exemption certificates are used otherwise, or are sold to employees or others, such fact must be reported to the Federal Tax Office of the article or articles covered by this certificate. It is also understood that the fraudulent use of this certificate to secure exemption will subject the undersigned and all guilty parties to a fine of not more than $10,000.00 or to imprisonment for not more than five years, or both, together with costs or prosecution.

_____
(Name of Organization)

By _____ (Signature)

SALES OR USE TAX EXEMPTION CERTIFICATE

Name of Buyer: _____

Address: _____
City State Zip

The above named business, holder of the following State permit number
Number: _____ State: _____
respectively certifies that all tangible property purchased from Kovatch Mobile Equipment Corporation, Nesquehoning, Pennsylvania is exempt from Sales of Use Tax for reasons(s) checked below:

☐ Resale as tangible personal property ☐ Governmental Unit or Instrumentality

☐ Non or Charitable Unit

☐ Other (Explain Fully)_____

Signature: _____ Title: _____

Date: _____

Federal Excise Tax and State Sales Tax will be added if the above form is not completed and signed.