



**KME FIRE APPARATUS**

**RIVERSIDE CITY**

**Quote # QUO0000010044 (Rev 1)**

**January 10, 2025**

**DESIGN CLAUSE - PRICE SLOT 42**

QTY: 1

These specifications outline the components, installation methods, and operational characteristics KME is agreeing to provide in order to meet the purchaser's requirements. Subject to the terms of the purchase agreement, other construction details not explicitly listed in these specifications will be determined at the discretion of the builder. In the event the purchaser desires a different construction or installation not already described in these specifications, additional charges may apply, and quoted lead time commitments will be adjusted.

**ENGINE CLAUSE**

If an L9 engine is **NOT** available or cannot be provided for that specific quote or build slot at time of production, you will **automatically be upgraded and charged for an X12 (or the X10 engine) with all costs associated with the upgrade being passed on to the end user. No exceptions.**

**MATERIAL & WORKMANSHIP**

QTY: 1

All equipment furnished shall be guaranteed to be new and of current manufacture, to meet all requirements of these specifications.

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

**APPROVAL DRAWING**

QTY: 1

A detailed drawing of the apparatus shall be provided to the purchaser for approval before construction begins. A copy of this drawing shall also be provided to the manufacturer's representative. Upon purchaser's 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 suction, discharges, etc. The drawing shall be a visual interpretation of the apparatus as it is to be supplied.

**DELIVERY**

QTY: 1

Delivery of the apparatus to the customer shall remain the bidder's responsibility.

On initial delivery of the fire apparatus, a qualified and responsible representative of the contractor shall demonstrate the apparatus and provide initial instruction to representatives of the customer regarding the operation, care, and maintenance of the apparatus and equipment supplied.

**VEHICLE FLUID PLATE**

QTY: 1

As required by NFPA-1900, the contractor shall 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 shall 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

**MANUFACTURED IN UNITED STATES**

QTY: 1

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.

**AMP DRAW REPORT**

QTY: 1

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-1900.
- 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-1900.

**AS-BUILT AIR SYSTEM SCHEMATICS**

QTY: 1

In accordance with standard commercial practices, KME will supply two (2) copies of "AS BUILT" air schematics/diagrams for the air system at the time of delivery.

**INSPECTION TRIPS (3)**

QTY: 1

The successful bidder shall provide three (3) factory inspection trips to the apparatus manufacturer's facility.

Transportation, meals, lodging, and other requisite expenses shall be the bidder's responsibility.

**ACCOMMODATIONS FOR THREE (3)**

QTY: 1

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:

**TRIP ONE (1) AT PRE CONSTRUCTION**

QTY: 1

Pre-construction / blueprint review.

**TRIP TWO (2) AT MID-POINT COMPLETION**

QTY: 1

Midpoint completion of entire apparatus.

**TRIP THREE (3) AT FINAL COMPLETION**

QTY: 1

Final inspection upon completion.

**COMPLETION INFORMATION**

QTY: 1

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

- 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)
- Company name and signature of responsible company representative
- 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 third party certification of inspection and test for the fire pump (if applicable).

If the apparatus has an aerial device the third party 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 applicable).

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) shall be supplied with the complete vehicle to determine compliance with NFPA-1900.

Written load analysis and results of electrical performance tests.

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

#### **FMVSS REQUIREMENT**

QTY: 1

The chassis shall be certified by the apparatus manufacturer as conforming to all applicable Federal Motor Vehicle Safety Standards in effect at the date of contract.

This shall be attested to by the attachment of a FMVSS certification label on the vehicle by the contractor who shall be recognized as the responsible final manufacturer.

#### **GENERAL CONSTRUCTION**

QTY: 1

The complete apparatus, assemblies, subassemblies, component parts, etc., shall 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 to be subject.

All parts of the apparatus shall 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 apparatus shall be strong enough to withstand general service under full load.

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

Bidder's specifications must meet minimum requirements of N.F.P.A. Pamphlet #1901 and all State and Federal Department of Transportation vehicle regulations at time of sale of unit.

The apparatus shall be designed and constructed, and the equipment so mounted, with due consideration to distribution of the load between front and rear axles that all specified equipment, including a full complement of specified ground ladders, full water tank, loose equipment, and firefighters shall be carried without overloading or injuring the apparatus.

#### **PAINT CERTIFICATION**

QTY: 1

The finish paint shall be certified by the apparatus manufacturer as conforming to all applicable Commercial Vehicle Paint Standards in effect at the date of contract.

This shall be attested to by the attachment of a Sikkens certification.

#### **INSTRUCTION MANUALS - TWO (2) SETS - USB**

QTY: 1

In accordance with standard commercial practices, applicable to each vehicle (including body and special equipment) furnished under the contract, the following listed manuals and schematics, in the quantity specified, shall be provided at time of delivery of each vehicle.

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

The manual shall contain the following:

- Descriptions, specifications, and ratings of chassis, pump (if applicable), and aerial device
- 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

#### **CUSTOM AS-BUILT ELECTRICAL SCHEMATICS**

QTY: 1

KME will provide custom formatted electrical drawings, including circuit level drawings, for use in troubleshooting the apparatus.

The schematics will consist of multi-page, circuit level information with connection and location information for the full electrical system as installed on the truck.

#### **VEHICLE TRANSPORTATION - KME PROVIDED**

QTY: 1

Transportation of the completed vehicle from the final manufacturing facility to the end user shall be provided by the manufacturer.

#### **!!! CRITICAL OVERALL LENGTH REQUIREMENT !!! - "YES - 30'**

QTY: 1

This vehicle has a critical overall length restriction requirement due to fire station length or obstruction within the fire department/district.

Maximum overall length of vehicle cannot exceed: \_360"\_\_" (inches).

#### **GENERAL INFORMATION - NFPA 1900**

QTY: 1

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

This proposal details the 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 fullest extent possible with the National Fire Protection Association Pamphlet No. 1900, latest edition, except as noted in the Statement-of-Exceptions.

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

#### **NFPA TREADPLATE CERTIFICATION**

QTY: 1

All stepping, standing, and walking surfaces on the body shall meet NFPA 1900 anti-slip standards.

Aluminum tread plate utilized for stepping, standing, and walking surfaces shall be NFPA embossed compliant.

Upon request by the purchaser, the manufacturer shall supply proof of compliance with this requirement.

#### **VERTICAL TREAD PLATE - NON-EMBOSSSED**

QTY: 1

The following vertical surfaces on the vehicle (if applicable) shall have non-embossed tread plate:

To include but not limited to:

- Rear of cab overlay
- Rear body overlay
- Front of body overlay
- Front pump house panel
- Custom cab step well
- Fender overlay
- Fender compartment doors
- Interior cab trim
- Upper body walkway walls
- Rescue body interior (walk-In/walk through)

#### **"PUMPER FIRE APPARATUS" NFPA 2024 CHAPTERS**

QTY: 1

The unit shall be designed to conform fully to the "Pumper Fire Apparatus" requirements as stated in the NFPA 1900 Standard (2024 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

#### **NFPA "CHAPTER 20" FOAM SYSTEM REQUIREMENTS**

QTY: 1

## Chapter 20 Foam Proportioning Systems

**SAFETY SIGNS (NFPA REQUIRED)**

QTY: 1

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.

**THIRD PARTY TESTING**

QTY: 1

If required by the specific chapters of NFPA-1900, the proposed unit shall be tested and certified by independent third party inspectors.

All test work for fire pumps outlined in NFPA 1900, Edition shall be conducted.

The third party inspectors shall provide the manufacturer a complete written examination and test report for each inspection performed at the manufacturer's facility.

This report specifies the points of inspection and results of such examinations and tests.

The inspectors performing the test work on the units are certified to Level II in the required NDT methods, under the requirements outlined in ASNT document CP-189.

The actual person(s) performing the inspection shall present for review proof of Level II Certification in the required NDT methods.

The apparatus manufacturer shall designate, in writing, who is qualified to witness and certify these test results.

Prior to submittal to the automotive fire apparatus manufacturer, the final Report shall be reviewed by the Supervisor of Fire Equipment Services and a Registered Professional Engineer, both of whom are directly involved with the aerial device certification program.

When the unit successfully meets all the requirements outlined in NFPA 1900, current edition, the third party inspector shall issue a Certificate of Automotive Fire Apparatus Examination and Test stating the unit's compliance with NFPA- 1900.

**SEVERE SERVICE CAB - BASE, 100" - S2020**

QTY: 1

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.

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

**CAB MATERIAL**

QTY: 1

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, 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**

QTY: 1

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.

Furthermore, proof of testing and certification shall be provided that the cab, in accordance to SAE J2420 was front impact tested at 2.1 times the standard energy required in SAE J2420, thus exceeding the NFPA requirement.

This test shall be performed with no support immediately behind the cab, thus providing an authentic test result.

### **CAB LENGTH**

QTY: 1

Minimum Cab Dimensions:

- Overall width 100"
- Inside width across ceiling 92"
- Front area floor to ceiling 61-3/4"
- Top of front seat to ceiling 44" (depending upon seat type)
- Seat back to steering wheel 21-1/4" (depending upon seat type)
- Inside width (door to engine enclosure) 24" (driver's side, at floor)
- Inside width (door to engine enclosure) 20-1/2" (officer's side, at floor)
- Crew seat area width 92"
- Outer crew seat risers to rear wall 41-1/2"
- Centerline axle to rear wall 59-1/2"

Glass Area Dimensions:

- Windshield (Contour) 3,422 sq. in.
- Side door window, retractable 625 sq. in. each
- Side fixed crew windows 550 sq. in. each

### **CAB ROOF**

QTY: 1

Cab Entry Door Height Dimensions:

- Forward door opening 76" high

- Rear door opening 86" high

The roof will be a split level design with radius edges for an aesthetic, streamline appearance. The roof shall be constructed with the same material as the main structure and 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 ten (10) 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 64"
- Top of crew seat to ceiling 45" (depending upon seat type)

#### **TREAD PLATE OVERLAY ON CAB ROOF**

QTY: 1

A bright finish tread plate overlay shall be placed on the cab roof.

This overlay shall be placed on the raised roof section, or if a flat roof cab is being utilized, from the area of the "B" post area-rearward, and extending back to the end of the cab roof.

This tread plate overlay shall be sealed with caulking around the edges to prevent moisture from entering the area between the cab roof and the overlay.

#### **PAINTED DRIP RAIL ON SIDES OF CAB**

QTY: 1

For enhanced protection from inclement weather, an integral painted drip rail shall be provided on the sides of the cab just below the cab roof.

#### **CAST ANTI-SLIP ENTRY STEPS**

QTY: 1

The front entrance steps shall be a minimum of 9" deep.

Each step shall be a cast aluminum, open grate style step fabricated by Cast Products Inc. with a polished aluminum outer surface.

The cab step risers shall be overlaid with .063" tread plate plate.

The rear entrance steps shall be a minimum of 9" deep.

Each step shall be a cast aluminum, open grate style step fabricated by Cast Products Inc. with a polished aluminum outer surface.

The cab step risers shall be overlaid with .063" tread plate plate.

#### **BATTERY ACCESS DOORS**

QTY: 1

The battery access door(s) shall be 1/8" tread plate, drop down doors with thumb latches at each side rear cab step well.

#### **SCOTCHLITE INTERIOR OF DOOR PANELS**

QTY: 1

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

### **CAB DOORS**

QTY: 1

Four (4) side-opening doors shall be provided. The cab doors shall be shortened to the floorboard level thus leaving an exposed step well area at each cab entrance. The cab doors shall be totally constructed of aluminum with an extruded aluminum frame and an aluminum outer door skin. The forward cab door opening shall be a minimum of 37" wide and the rear cab door opening shall be a minimum of 37" 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.

### **HINGES, CAB DOOR**

Each cab door will be attached to the cab with two-(2) concealed automotive style hinges with restraining strap.

There shall be a cab door seal and the doors shall close flush with the side of the cab. A heavy-duty 6" wide belting material shall be utilized to prevent the cab doors from opening greater than 85 degrees.

### **CAB DOOR INSULATION**

QTY: 1

A 1/4" insulation panel shall be installed in each cab door. This insulation panel shall provide an additional acoustical barrier as well as help with heating/cooling properties of the apparatus.

### **HIDDEN WEATHER STRIP**

QTY: 1

The cab doors shall be equipped with a weather strip seal track on the lower portion of the door. Bolt-on tracks shall be provided to allow for a snap-on replaceable weather stripping to be changed easily and shall be fastened in place with nutserts to ensure longevity.

### **CAB DOOR LATCHES**

QTY: 1

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/rods are to be designed to reduce adjustment or possible wear at the adjustment turnbuckles.

### **KEY MODEL #1250**

QTY: 1

The specified door lock cylinder/s shall be equipped with #1250 key/s.

### **DOOR LOCKS**

QTY: 1

Each exterior cab door shall be equipped with keyed locks.

The cab doors shall be capable of being locked from the outside with a key and manually from the inside or with a momentary switch that shall either lock or unlock the doors.

A switch shall be provided on both the driver and officer side of the cab dash.

### **KEYLESS ENTRY**

QTY: 1

A Trimark brand, keyless entry system shall be provided on all cab doors.

This system shall lock the doors by use of the key fob and shall unlock the doors by either the key fob or the touch pads.

The system shall include two (2) "e-PAD", five number lighted touch pads mounted one (1) each side to the rear of each front cab door.

The system shall also incorporate two (2) "e-FOB", 2 button RF transmitters, one (1) RF receiver module and a total of four (4) power door lock actuators.

The driver door shall have a traditional key - lock installed.

### **ELECTRIC WINDOWS**

QTY: 1

Each side cab door shall have a tinted retractable window. 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.

All side cab doors shall be equipped with electrically operated windows. Power window controls for all doors shall be provided on the driver's lower wing dash panel. The officer side power window control shall be on the officer's lower wing dash panel.

The control for each rear door shall be a rocker type, automotive style switch located on the inside door panel within easy reach.

### **DOOR WINDOW TRIM EXTRUSION**

QTY: 1

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.

### **CAB DOOR WINDOW SILL PROTECTION**

QTY: 1

Brushed stainless steel protection caps shall be provided on each door interior window sill.

The caps shall be fabricated from 18-gauge brushed stainless steel and cover from the window edge down over the sill and meet the inner door panel top edge.

### **DOOR PANELS**

QTY: 1

The cab door interior panels shall be covered with a brushed stainless steel panel, at full height.

The panel shall be 16 gauge stainless steel with a brushed finish and shall be designed to allow easy access to the inner door.

### **INNER DOOR PANEL TO BE THREE (3) PIECE DESIGN**

QTY: 1

The inner door panel shall be designed as a three (3) piece panel to allow easy access to the door latching mechanism, electrical components or the window mechanism without disassembling the entire door.

**POLISHED S/S SCUFF PLATES @ EACH CAB DOOR FRAME**

QTY: 1

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.

**WINDSHIELD**

QTY: 1

A two 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 3244 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.

Single piece windshields that utilize epoxy or that are bonded to the cab structure shall not be acceptable.

**WINDSHIELD WIPERS & WASHERS**

QTY: 1

Dual, electric operated, pantographic type windshield wipers shall be provided.

One (1) electric drive motor shall be provided for each wiper.

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.

Windshield washers shall be electric operated wet-arm type with a 1/2 gallon washer fluid reservoir, mounted behind a hinged access door in the officer side front cab step well area. The fluid level shall be visible through a cutout in the access door. This door shall be secured with two thumb latches.

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.

Windshield wipers shall survive testing in excess of 3 million cycles in accordance with section 6.2 of SAE J198 "Windshield Wiper Systems – Trucks, Buses and Multipurpose Vehicles".

The bidder shall certify that the wiper system design has been "Third party tested" and that the wiper system has met this criteria.

**SIDE VIEWING WINDOWS**

QTY: 1

A fixed, tinted window with 620 sq. in of glass area shall be provided on each side of the cab behind the forward cab doors.

This window will be the same height as the window in the rear cab door for maximum visibility.

**DARK TINT WINDOWS**

QTY: 1

The windshield and the forward cab door glass shall be provided with standard DOT, green automotive tint.

If provided, 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.

**CAB GRAB RAILS EXTERIOR**

QTY: 1

1-1/4" diameter x 28" long, knurled bright anodized aluminum handrails shall be provided.

There will be 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.

**CAB GRAB HANDLES, INTERIOR**

QTY: 1

Grab rails shall be provided to assist in entry and exiting of the cab. Each grab rail shall be a cast aluminum "D" style handle that shall have a wheelabrated finish and shall be located in the following locations:

- One (1) 11" long, horizontally mounted on each front cab door on the interior door panel
- One (1) 11" long, horizontally mounted on each rear cab door on the interior door panel

**INTERIOR GRAB RAILS-REAR CREW DOORS-BALL-BURNISHED**

QTY: 1

One (1), horizontally mounted, on each rear cab door, located at the same height as the window in the lowered position.

**FRONT CAB GRILLE**

QTY: 1

A square mirror finished stainless steel grille shall be installed to allow for maximum air flow to the charge air cooler and the radiator. The top of the grille will have a flat area for the manufacturers emblem.

A four (4) inch wide solid band shall extend across the middle of the grill for lettering or lighting options.

**SIDE CAB GRILLES**

QTY: 1

Two (2) rectangle, mirror finished stainless steel air inlets/outlets shall be provided horizontally above the wheel well opening, one on each side of the cab.

The grilles shall be equipped with a mesh screen to serve as a secondary ember separator.

The design shall permit proper ducting of air through the engine compartment and cooling system.

This system shall be such that particles larger than .039 inches (1 mm) in diameter cannot reach the air filter element.

#### **CAB EXTERIOR REAR WALL**

QTY: 1

A bright finish tread plate overlay shall be provided over the entire exterior rear cab wall.

The tread plate overlay shall be sealed with caulking around the edges to prevent moisture from getting between the cab and the overlay.

#### **CAB WHEEL WELL LINERS - ALUMINUM**

QTY: 1

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.

#### **ALUMINUM CAB FENDERETTES**

QTY: 1

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.

Dissimilar metal tape and black vinyl trim molding shall be used where the cab and fender meet.

#### **FRONT MUD FLAPS**

QTY: 1

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

#### **CAB MIRRORS**

QTY: 1

Two, (2) Ramco model 6001 FFHR-750HR polished aluminum, full face, heated, remote operated, 13 inches high X 9 3/4 wide mirrors, with a 750 top add-on heated/remote convex mirror, on a standard arm length of 15 inches shall be provided and installed.

The flat glass and top mirror head shall be remote operated with controls on the driver's lower wing panel.

The mirror head shall be attached to a polished, aluminum arm, mounted on the cab radius panel.

#### **MIRROR CONTROL**

QTY: 1

In addition to the switches on the driver's lower wing panel, the mirror position and heat (if applicable) controls shall be programmed into the multiplex control screen.

#### **DOOR WIDTH, X-MFD, LFD & X-LFD - 100" SS**

QTY: 1

**Cab Entry Door Width Dimensions:**

- Forward door opening 37" wide
- Rear door opening 37" wide

**Cab Entry Step Dimensions:**

- Forward door recessed step 29 3/4" wide x 8-1/2" deep
- Rear door recessed step 25 3/4" wide x 8-1/2" deep

**INTERIOR TRIM- BLACK VINYL**

QTY: 1

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 a fabricated module, which shall have six (6), 3" diameter, adjustable, windshield defroster/heat vents and four (4) comfort vents.

All interior upholstery panels shall be black in color.

The upholstered cab overhead and side wall portions shall utilize vinyl upholstery with padding underneath to provide additional insulation.

**INTERIOR CAB WALL BLACK VINYL**

QTY: 1

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

**CAB FLOORING**

QTY: 1

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.

**ACOUSTICAL INSULATION**

QTY: 1

One (1) inch thick acoustical insulation shall be provided on the cab roof, 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.

**TREAD PLATE FLOOR OVERLAY**

QTY: 1

The floor of the driver's, officer's area and the floor of the crew area shall be covered with bright finish tread plate over the standard floor covering.

**ENGINE ENCLOSURE ACCESS**

QTY: 1

A composite, hinged access door shall be provided in the top rearward portion of the engine enclosure. The door shall allow access to the engine oil, power steering fluid level dipsticks. The access door shall be provided with a flush mounted latch. The underside of the access door shall be insulated. The transmission oil level will be viewed through the Allison Touchpad or by tilting the cab.

**HD SOUNDPROOFING/ INSULATION PACKAGE UNDER ENGINE**



QTY: 1

The underside of the engine enclosure shall be overlaid with Milcut MilShield insulation which can withstand temperatures up to 1300°F. The material shall have a heavy aluminum foil covering and shall be provided with 3M #425 aluminized high temperature tape sealing any gaps between panels.

**HD SOUNDPROOFING/INSULATION BETWEEN UPHOLSTERY**

QTY: 1

To further reduce the noise and heat levels inside the cab, 1/4" foam upholstery material shall be installed on all interior surfaces of the engine enclosure, below the upholstery material.

**ENGINE ENCLOSURE OVERLAY MATERIAL**

QTY: 1

The forward portion of the engine enclosure shall be covered with vinyl 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 material 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 1901 pamphlet.

**SUN VISORS**

QTY: 1

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

**OVERHEAD PANEL, FABRICATED CENTER THREE WING PANEL**

QTY: 1

An overhead console with a center three piece removeable panel assembly shall be provided on the cab roof between the driver and officer to permit installation of the multiplex smaller sized control screens and other components as space allows.

The overhead console 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.

**SEAT AND SEAT BELT ANCHOR TESTING**

QTY: 1

Each seat belt anchor shall be tested to withstand 3,000lbs of pull on both the lap and shoulder belt in accordance with FMVSS 210 section 4.2.

Each seat mounting position shall be tested to withstand 20G's of force in accordance with FMVSS 207 section 4.2(c).

Both tests shall be performed and verified at a third party testing and evaluation center.

**STORAGE COMPARTMENTS UNDER FRONT SEATS**

QTY: 1

There shall be a compartment provided under each front seat.

Each compartment shall be accessible from the front of the seat riser when the door is opened.

**DRIVERS SEAT, VALOR AIR SUSPENSION, ABTS**

QTY: 1

The driver's seat shall be a Valor, air suspension, race back bucket ABTS LH seat.

The seat shall have a contoured and padded seat cushion with adjustable lumbar support.

The seat shall have a horizontal, slide adjustment and a vertical height adjustment with an adjustable back recline.

The seat air suspension shall be pneumatically controlled from a switch on the forward, lower edge of the seat.

The seat shall be equipped with a red, integrated, 3-point shoulder harness with a lap belt, and a dual retractor belt configuration.

It should have ready reach built into the seat assembly.

**OFFICERS SEAT, VALOR - AIR SUSPENSION, ABTS**

QTY: 1

The officer's seat shall be a Valor air suspension, ABTS RH, bucket seat.

The seat shall have a contoured and padded seat cushion with adjustable lumbar support.

The seat shall have a horizontal slide adjustment and a vertical height adjustment with adjustable back recline.

The seat air suspension shall be pneumatically controlled from a switch on the forward, lower edge of the seat.

The seat shall be equipped with a red, integrated, 3-point shoulder harness with lap belt, and a dual retractor belt configuration with ready reach built into the seat assembly.

**SCBA BRACKET MOUNTING POSTS**

QTY: 1

Two vertical posts, one each side, will be provided on the rear facing seat bases for mounting of an SCBA bracket.

The posts will be bolted to the seat bases.

**VALOR BUCKET, ABTS, FWD FACING, OUTBOARD, DS**

QTY: 1

The driver's side outboard forward facing crew seat shall be a Valor ABTS LH fixed base bucket seat.

The seat shall have a contoured and padded seat cushion.

The seat shall be equipped with a red, integrated, 3-point shoulder harness with lap belt and a dual retractor belt configuration with ready reach built into the seat assembly.

**FORWARD FACING SEAT, OUTBOARD, DS**

QTY: 1

The driver's side outboard, forward facing, crew seat shall have a flip-up style seat.

**VALOR BUCKET ABTS - FORWARD FACING, OUTBOARD, OS**

QTY: 1

The officer's side outboard, forward facing, crew seat shall be a Valor ABTS RH fixed base bucket seat.

The seat shall have a contoured and padded seat cushion.

The seat shall be equipped with a red, integrated, 3-point shoulder harness with lap belt and a dual retractor belt configuration with ready reach built into the seat assembly.

**FORWARD FACING SEAT, OUTBOARD, OS**

QTY: 1

The officer's side outboard forward facing crew seat shall have a flip-up style seat.

**(1) - VALOR BUCKET ABTS FORWARD FACING, CENTER**

QTY: 1

One (1) center inboard forward facing crew seat shall be a Valor ABTS bucket seat. The seat shall have a contoured and padded seat cushion.

The seat shall be equipped with a red integrated 3-point shoulder harness with lap belt, and a dual retractor belt configuration with ready reach built into the seat assembly.

**BOTTLE BRACKET**

QTY: 1

One (1) center inboard forward facing crew seat shall have a flip-up style seat.

**VALOR CUSTOM EMBROIDERED EMBLEM ON SEATS**

QTY: 1

The seats shall be equipped with a custom embroidered logo, matching the fire department's requirements.

**SEAT ADJUSTMENT NOTICE**

QTY: 1

If equipped, adjustable seats may be limited by outside factors such as optional installed equipment (ie. ems compartments, battery chargers, SCBA cylinder brackets) and seat placement.

**HELMET HOLDER**

QTY: 4

Each seat position shall have a On Scene Solution Talon Helmet Locking System, meeting NFPA 1901, 2016. The holder shall accommodate all helmet sizes.

**VALOR SEATING MATERIAL - BLACK CORDURA/RED STITCH**

QTY: 1

The seats shall be upholstered with Black Cordura material with RED stitching as provided by Valor.

**VEHICLE DATA RECORDER**

QTY: 1

A Class 1 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

The VDR data shall be downloadable by USB cable to a computer using either Microsoft or Apple operating systems.

#### **SEAT BELT WARNING SYSTEM**

QTY: 1

The apparatus shall be equipped with a Class 1, seat belt warning system.

The system shall consist of a seat belt module and shall display the seating positions through the main, UltraView screen.

#### **FIVE (5) SEATING POSITIONS**

QTY: 1

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

#### **DELETE - 4FRONT - FRONTAL AIR BAG SYSTEM**

QTY: 1

#### **ENGINE ENCLOSURE STORAGE MODULE**

QTY: 1

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 the finish shall match the cab interior finish.

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.

#### **DRINK HOLDER - DRIVER AND OFFICER**

QTY: 1

A single drink holder shall be installed on each side of the engine enclosure, convenient to the driver and the officer.

#### **DRINK HOLDER - CREW AREA**

QTY: 2

A single drink holder(s) shall be installed on the rear of the engine enclosure, convenient to the crew.

#### **OFFICER FOLD DOWN FOOT REST**

QTY: 1

A fold down foot rest shall be provided on the firewall electrical access panel, in front of the officer's seating position.

The foot rest shall be designed with a 14" wide x 3" deep foot rest plate.

#### **COMPUTER TERMINAL IN FRONT OF OFFICER**

QTY: 1

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

#### **HEATER/DEFROSTER & ACCESSORIES**

QTY: 1

A climate-control system shall be provided for total cab environmental comfort as well as provide heat, cooling and defrost capabilities to various areas in the cab.

The system shall consist of a single evaporator unit, mounted in the center overhead of the cab.

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

- Heavy-duty, high output blower.
- High efficiency coil that includes "rifled" tubing and oversized header tubes for maximum refrigerant distribution.
- Four (4) 2" diameter, adjustable louvers; two (2) each side of the cab overhead, facing the driver and officer seat positions.
- Six (6) larger louvers evenly spaced, forward of the overhead assembly, facing the windshield.
- Multi-vent defroster louvers positioned above the windshield will provide adequate airflow for windshield defrost.
- Four (4) lower vents shall be provided, one (1) below the driver and officer seat positions and one (1) under each outboard rear facing crew seat.
- Twelve (12) vents shall be provided on the HVAC unit for crew comfort.
- Damper controls shall be pneumatically operated to provide air discharge to the windshield, front overhead air discharge louvers as required.
- An adjustable electric water valve to control the amount of heat.
- Housing shall be fully insulated and enclosed.
- BTU: 69,000 A/C
- BTU: 72,100 Heat
- CFM: 680 Heat as mounted in the cab
- CFM: 680 A/C as mounted in the cab

The ceiling mounted evaporator unit/s shall be designed with an ergonomically designed cover to provide maximum headroom and a pleasing appearance with a crinkle coat texture and include a deep well condensate collection pan, which shall be drained by a gravity system into the rear corners of the engine compartment utilizing stainless steel drain poles.

Evaporator units shall be mounted on the cab roof, enclosed by aluminum panels painted white. The evaporator louvers and controls shall penetrate the cab roof into occupant compartments to the least extent practicable. Evaporator units shall be mounted on the cab ceiling, enclosed by a black painted aluminum cover.

A serviceable foam intake filter shall be installed on the rear of the evaporator.

All defrost/heating systems will be plumbed with one (1) seasonal shut-off valve mounted in the officer side wheel well area.

A 12-volt roof top dual condenser shall be mounted on the cab roof. The condenser shall be designed with high performance, long life fan assemblies with sealed housings and shaft. The condenser and coil design shall include rifled tubing for maximum efficiency. Each coil shall be painted black. The condenser unit must include a receiver drier with a high and low pressure switch. The wire harness shall include necessary wiring for the clutch circuit as well as a separate power relay circuit.

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

The apparatus air conditioning system shall be powered by a 19.8 CID compressor compatible with R134A refrigerant. The compressor shall meet low leakage requirements in compliance with EPA 2027 regulations. The system shall use R134a refrigerant. The air conditioner lines shall be EATON GH001 EverCool SAE J2064 Type E hose secured using EATON E-Z Clip system components.

Air conditioning hoses shall be #10 hose for discharge and #12 hose for suction with steel hose and end fittings provided at the compressor. The heater hose installation shall not incorporate a copper tube manifold.

The air conditioning system shall be configured to only operate when the vehicle's engine is running. The blowers, in both evaporators, shall be in operation whenever the air conditioning system is activated.

Heater-defroster shall have a three-speed electric fan with illuminated controls. The controls system shall actuate the air-distribution system with air cylinders, which are to be separated from the air brake system by an 85-90 psi pressure protection valve.

The 12-volt system for the air conditioners shall have first priority to be load managed.

The heater/defroster unit shall clear the windshield in half-the-time required by SAE standards.

#### **PAINT ROOF MOUNTED CONDENSOR**

QTY: 1

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

#### **HVAC CONTROLS**

QTY: 1

HVAC controls shall be provided on the driver's overhead wing panel, consisting of a mode selector control, front fan speed, rear fan speed, air conditioning on/off and temperature range selection.

The controls shall be clearly labeled, adequately backlit.

The multiplex system control screen shall also contain all controls for the cab HVAC control system.

**ACTIVE AIR PURIFICATION SYSTEM**

QTY: 1

An Active Air Purification system shall be provided. The system utilizes RGF's Photohydroionization® Cell (PHI-Cell®) technology which produces hydro-peroxides, and hydroxide ions. The resulting Advanced Oxidation Process reduces airborne mold, bacteria, viruses and odors up to 99%.

The unit shall have a stainless steel housing and contain a fan to move air across the PHI cell and out of the housing.

The system shall be wired to the vehicle 12 volt system. The unit shall be powered on either when the shore power is connected or the apparatus ignition power is switched on. The air purification system shall be installed in the crew area as specified.

**CAB TILT SYSTEM**

QTY: 1

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

The cab tilt mechanism shall be custom designed for ease of maintenance and consist of two (2) hydraulic cylinders connect to the cab and the frame assembly.

Hydraulic lines shall be rated at 20,000 PSI burst pressure.

The hydraulic cylinders shall be equipped with a velocity fuse that protects the cab from accidentally descending when the cab is in the tilt position.

Hydraulic cylinders shall be detachable to allow removal of the engine for major service.

A remote cable operated mechanical cylinder stay bar and release shall be provided to insure a positive lock in the tilted position.

The two (2) rear 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 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 plug-in tethered control with dual push buttons shall be provided for cab tilt operations. The receptacle for the tethered control shall be provided in the officer side pump panel or body officer side front compartment if there is no pump panel.

**MANUAL CAB TILT**

QTY: 1

An auxiliary, manual cab, lift backup system shall be furnished inside the passenger side of the pump enclosure or front compartment for use in the event of total electrical shutdown.

The removable handle shall be provided as loose equipment.

**CAB TILT AUDIBLE ALARM**

QTY: 1

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

**SECONDARY SAFETY LOCK**

QTY: 1

A secondary, swing down, safety bar shall be applied to the driver side cab tilt cylinder with a manual lock to engage the lock, as required for extended service operations.

**PARKING BRAKE/CAB TILT INTERLOCK**

QTY: 1

The cab tilt control shall be equipped with an interlock.

This shall disable the cab tilt system in the event the parking brake is not applied.

**FRAME ASSEMBLY**

QTY: 1

The chassis frame shall be assembled in its entirety at the manufacturer's facility. This will 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. Frame assemblies that are welded or assembled with Huck type fasteners are not acceptable.

Each main frame rail shall be 10-1/4" x 4" x 3/8", fabricated from Domex 110,000 PSI minimum yield steel, with a minimum section modulus of 18.396 cu in. and a resisting bending moment (RBM) of 2,023,560 inch pounds. Frames are built for the specific apparatus under construction so that no unnecessary holes or modifications are made to the frame assembly.

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**

QTY: 1

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.

**FRONT BUMPER EXTENSION**

QTY: 1

The bumper shall be extended 16" with a polished aluminum, tread plate, gravel shield enclosing the top and ends.

**CENTER WELL**

QTY: 1

One (1) storage well constructed of 1/8" aluminum shall be installed in the gravel shield. This storage well shall be center mounted between the chassis frame rails. The bottom of the storage well shall have a minimum of four (4) drain holes.

**ONE (1) HINGED, LATCHED, TREAD PLATE COVE**

QTY: 1

One (1) hinged, latched, aluminum, tread plate cover shall be installed on the storage well located in the center of the bumper extension.

**CENTER WELL - HOSE CAPACITY**

QTY: 1



The center storage well shall have the desired capacity of:

**CENTER WELL - 100 FEET OF 1-3/4" HOSE**

QTY: 1

100' of 1 3/4" hose

**HOSE WELL OFFICER SIDE OF BUMPER EXTENSION**

QTY: 1

One (1) storage well constructed of 1/8" aluminum (will/shall) be installed in the gravel shield. This storage well (will/shall) be located on the officer side of the bumper extension. The bottom of the storage well (will/shall) have a minimum of four (4) drain holes.

**ONE (1) HINGED, LATCHED, TREAD PLATE COVER**

QTY: 1

One (1) hinged, latched, aluminum, tread plate cover shall be installed on the storage well located in the officer side of the bumper extension.

**OFFICER WELL - HOSE CAPACITY**

QTY: 1

The officer storage well shall have the desired capacity of:

**OFFICER WELL - 25 FEET OF 4" LDH HOSE**

QTY: 1

25' of 4" LDH hose

**TOW EYES**

QTY: 1

Two (2) painted steel tow eyes shall be fastened directly to the bumper support structure that extends below the bumper.

The tow eyes shall be fastened with grade 8 bolts and nuts.

**FRONT AXLE**

QTY: 1

The Steertek NXT front axle beam shall be rated to carry 20,000 lbs. and consist of a fabricated box cross section construction with 100ksi plate and a continuous beam architecture to minimize stress points for added durability.

The axle shall incorporate a removable kingpin feature for ease of kingpin serviceability. The knuckles shall allow for compatibility with disc brakes mounted at the 12 o'clock position and with drum brakes, and allow for wheel cut up to 45 degrees. They shall also utilize premium kingpin bushings and seals to provide enhanced protection from the elements to improve bushing life. Oil seals with viewing window shall be provided.

The suspension shall consist of multi-leaf parabolic springs rated at 20,000 lbs with double wrapped front eye that are packaged within an integrated clamp group that allows for ease of OEM assembly on to the axle beam and reduced part count. The clamp group bolts are tightened on the top of the clamp group opposed to the traditional U-bolt on the bottom making it easier to access with a torque wrench for servicing. The spring shall also include a lower shock attachment with an upturned eye. The springs will contain threaded pin bushings to allow simplification of spring alignment as well as long service life and improved ride quality. The suspension and spring geometry will be optimized to provide improved bump steer and Ackermann. Two ZF Sachs twin-tube shocks shall be provided with the front suspension assembly. The shocks shall be specially developed for parabolic leaf springs with a digressive characteristic curve using a patented piston system. The shocks shall feature multi-stage piston and base valves. The combination of valves shall achieve the desired damping characteristics that are ideal for the application.

Meritor EX-225 H, 17" disc brakes shall be provided for the front axle.

The front brakes shall be full air actuated.

### **STEERING SYSTEM**

QTY: 1

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 steering gear on the officer side of the chassis.

The power steering gear on the officer side of the chassis shall 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 on front axles of this capacity.

The system shall be designed utilizing an engine driven hydraulic pump, with a maximum operating pressure of 2000 PSI.

Steering system components shall be mounted in accordance with the steering gear manufacturer's instructions.

### **STEERING COLUMN**

QTY: 1

The steering column shall be a "Douglas Autotech" tilt and telescope column.

A lever mounted on the side of the column shall control the tilt and telescope features.

The steering shaft from the column to the miter box shall have a rubber boot to cover the shaft slip and a second rubber boot to seal the passage hole in the floor.

There shall be a ergonomically designed, self-canceling lever, that shall control the following functions:

- Left and right turn signals
- High beam activation
- Two speed with intermittent windshield wiper control
- Windshield washer control

### **18" STEERING WHEEL**

QTY: 1

The steering wheel shall be a four (4) spoke, vinyl padded, minimum 18" diameter, with a center hub mounted horn button.

### **REAR AXLE**

QTY: 1

Rear axle shall be a single, Meritor RS-24-160 with a capacity of 24,000 lbs.

(Minimum). Axle shall be a single reduction type and have a gear ratio as required.

Oil seals shall be provided as standard equipment.

**REAR BRAKES**

QTY: 1

Meritor EX-225 H, 17" disc brakes shall be provided for the rear axle.

The rear brakes will be full air actuated.

**VEHICLE TOP SPEED NFPA STATEMENT**

QTY: 1

The rear axle/s (will/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 (will/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 (will/shall) be limited to 60 mph or the fire service rating of the tires, whichever is lower.

**REAR SUSPENSION**

QTY: 1

A Hendrickson, "FIREMAAX" model #FMX-242, air ride suspension shall be provided for the single rear axle.

The suspension shall have a weight rating equal to the rear axle weight rating up to 24,000 pounds.

**FRONT WHEELS**

QTY: 1

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

**FRONT TIRES**

QTY: 1

The front tires shall be Continental 385/65R22.5, "20 Ply", tubeless, radial, HTR2, wide base highway tread.

The tires shall be fire service rated up to 21,230 lbs and shall have a top speed of 68 mph when inflated to 130 psi.

**REAR WHEELS**

QTY: 1

The single, rear axle wheels shall be 22.5" x 8.25" ten stud, hub piloted, disc type.

The inner wheels shall be painted steel, the outer wheels shall be polished aluminum.

**REAR TIRES**

QTY: 1

The rear tires shall be Continental 12R22.5, "16 Ply", tubeless, radial, HDR2 traction tread.

The tires shall be fire service rated up to 29,020 lbs and shall have a top speed of 75 mph when inflated to 120 psi.

**TIRE PRESSURE MONITORING**

QTY: 1

Each tire shall be equipped with an LED tire alert pressure management system (Vecsafe equal) that shall monitor tire pressure. A chrome plated brass sensor shall be provided on the valve stem of each tire.

The sensor shall calibrate to the tire pressure when installed on the valve stem for pressures between 20 and 120 psi.

The sensor shall activate an integral battery operated LED when the pressure of that tire drops 8 psi.

### **AIR BRAKE SYSTEM**

QTY: 1

A dual circuit, air operated braking system, meeting the design and performance requirements of FMVSS -121 and the operating test requirements of NFPA 1900 current edition shall be installed.

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 1900, current edition.

### **ABS SYSTEM**

QTY: 1

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 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. 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.

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

### **ELECTRONIC STABILITY CONTROL**

QTY: 1

An Electronic Stability Control (4 or 6 Channel) shall be provided as part of the Standard ABS system. The Electronic Stability Control system is capable of recognizing and assisting in both rollover and vehicle-under and over-steer situations through advanced monitoring of vehicle parameters and automatic and selective application of the chassis brakes. The ESC system monitors the vehicle response to turning and braking and adjusts or modulates the brake pressure at the wheel end to slow the vehicle in roll control, stabilize the vehicle when under or over steering, and modulate brake pressure when excessive wheel slip, or wheel lockup is detected. By these actions, the ESC system helps to maintain the vehicle's lateral and roll stability at all times, and improves braking and steer ability during heavy brake applications and during braking on slippery surfaces.

To further improve vehicle drive characteristics the unit shall be fitted with automatic traction control (ATC). This system shall control drive wheel slip during acceleration from a resting point. An extra, solenoid valve shall be added to the ABS system.

The system shall control the engine and brakes to ensure efficient acceleration.

The system shall be equipped with a dash-mounted light that shall come on when ATC is controlling drive wheel slip.

The system shall also include an "off road traction" dash mounted switch that will allow the operator to momentarily allow for more wheel slip when the unit is in deep mud or snow.

### **AIR RESERVOIRS**

QTY: 1

There shall be a minimum of three (3) air reservoirs installed in conformance with best automotive practices.

An additional 800 cu. in. air reservoir shall be provided for an air manifold.

Reservoir capacity total shall be a minimum of 5500 cubic inches.

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 air reservoirs shall be color coded to match the air lines for easy identification, maintenance, and troubleshooting.

The reservoirs shall be painted the following colors:

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

### **1/4 TURN DRAIN VALVES SIDE OF BODY**

QTY: 1

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

The brass, quarter turn, air tank drains shall be remotely mounted to the side of the body on a labeled panel just forward of rear wheel for ease of maintenance.

### **HEATED AIR DRYER**

QTY: 1

A Bendix AD-IS heated air dryer system shall be furnished. The function of the AD-IS dryer reservoir module (DRM) is to provide an integrated vehicle air dryer, secondary reservoir, purge reservoir, governor, and a number of the charging valve components in a module. The DRM dryer module includes an integrated solution air dryer (AD-IS), a reservoir including a separate purge reservoir section, a governor, and four pressure protection valves which have been designed as an integrated, air supply system.

The function of the AD-IS air dryer is to collect and remove air system contaminants in solid, liquid and vapor form before they enter the brake system. It provides clean, dry air to the components of the brake system which increases the life of the system and reduces maintenance costs. Daily, manual, draining of the reservoirs is eliminated. The function of the pressure protection valves is to both control the order in which the components receive air from the AD-IS air dryer, as well as to protect each reservoir from a pressure loss in the other reservoir or a pressure loss in an air accessory.

An automatic, moisture ejector on the primary or wet tank shall also be furnished.

### **COLOR CODED BRAKE LINES**

QTY: 1

The entire chassis air system shall be plumbed utilizing reinforced, Synflex air lines, which shall be equipped with quick release type fittings.

All of the airlines shall be color coded to correspond with an air system schematic and shall be adequately protected from heat and chafing.

### **WABCO AIR COMPRESSOR**

QTY: 1

Air compressor shall be a Wabco brand, with a minimum of 18.7 cubic feet per minute capacity on L9 X15 models and 25.9 cubic feet per minute on X12 models.

Air brake system shall be the quick build up type.

The air compressor discharge line shall be stainless steel braid reinforced Teflon hose.

The chassis air system shall meet NFPA 1900, 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**

QTY: 1

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 CONTROL**

QTY: 1

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 driver lower wing panel.

A red, indicator light shall be provided in the driver dash panel that shall illuminate when the parking brake is applied.

### **ENGINE PACKAGE**

QTY: 1

### **ENGINE**

QTY: 1

Engine shall be a Cummins, Model X15 565, diesel, turbo-charged, per the following specifications:

- Max. Horsepower 565 HP @ 1700 RPM
- Governed Speed 2100 RPM
- Peak Torque 1850 lb. ft. @ 1150 RPM
- Cylinders Six (6)
- Operating Cycles Four (4)
- Bore Stroke 5.39 x 6.65 in.
- Displacement 912 cu. in.
- Compression Ratio 17.2:1
- Governor Type Limiting Speed

Engine oil filters shall be engine manufacturers branded or approved equal.

Engine oil filters shall be accessible for ease of service and replacement.

If a pre-2027 emission engine is **NOT** available at the time of build (**starting production on January 1, 2026**) your order will **automatically be upgraded and charged for either the 2027 engine compliant Cummins X-10 or X-15, with all associated costs being passed on to the end user. No exceptions.**

:

QTY: 1

#### **ENGINE IQA CERTIFICATION - X15**

QTY: 1

The Cummins X15 engine shall be certified by Cummins Power Systems for installation in the manufacturers custom chassis.

#### **SECONDARY BRAKING**

QTY: 1

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 AIR CLEANER**

QTY: 1

An engine air cleaner shall be provided. The air cleaner shall include a dry type element and 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.

The air cleaner shall be plumbed to the air intake system that shall include a self sealing connection between the cab and air cleaner assembly to allow the cab to be tilted.

To draw fresh clean air, the intake for the air cleaner shall be on the side of the cab on the driver's side.

The inlet shall be a minimum of 41" above the ground to allow the vehicle to navigate through water without any part of the air intake system being below the frame rail, preventing any type of water intake. There will be no exceptions. Per NFPA 1900, the height on the lowest point of the air intake shall be displayed in the cab.

#### **EMBER SEPARATOR**

QTY: 1

An ember separator shall be installed in the chassis air intake system.

The ember separator housing must be easily accessible when the cab is tilted.

#### **ACCELERATOR PEDAL - FLOOR MOUNT**

QTY: 1

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.

#### **REMOTE THROTTLE & INTERLOCK HARNESS**

QTY: 1

An apparatus interface wiring harness for the engine shall be supplied with the chassis. If applicable, separate circuits shall be included for pump controls, "Pump Engaged" and "OK to Pump" indicator lights, open compartment ground, start signal, park brake ground, ignition signal, master power, customer ignition, air horn solenoid switch, high idle switch and high idle indication light.

The engine ECM (Electronic Control Module) discreet wire remote throttle circuit shall be turned off for use with a J1939 based pump controller or when the discreet wire remote throttle controls are not required.

#### **COOLING SYSTEM**

QTY: 1

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

To provide maximum corrosion resistance and cooling performance, the entire radiator core shall be constructed using long life aluminum alloy.

The core shall be made of aluminum fins, having a serpentine design, brazed to aluminum tubes.

The tubes shall be brazed to aluminum headers.

No solder joints or leaded material of any kind shall be acceptable in the core assembly.

The radiator core shall have a height of 35.92" x a width of 37.62".

Supply and return tanks made of glass-reinforced nylon shall be crimped on to the core assembly using header tabs and a compression gasket to complete the radiator core assembly.

The radiator shall be compatible with commercial antifreeze solutions.

There shall be a full steel frame around the entire radiator core assembly.

The radiator core assembly shall be isolated within the steel frame by rubber inserts to enhance cooling system durability and reliability.

The radiator shall be mounted in such a manner as to prevent the development of leaks caused by twisting or straining when the apparatus operates over uneven ground.

The radiator assembly shall be isolated from the chassis frame rails with rubber isolators.

The cooling system shall include a surge tank mounted to the top of the radiator framework that shall remove air in the system.

The surge tank shall be equipped with a sight glass to monitor the level of coolant.



The radiator shall be equipped with a dual seal cap that shall allow for expansion and recovery of coolant into a separate integral chamber.

The cooling system shall be designed for a maximum of fifteen (15) PSI operation.

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

Extended life engine coolant shall provide anti-freeze protection to -30° F.

The mixture shall be per the engine manufacture's specifications.

#### **COOLING SYSTEM CRITERIA**

QTY: 1

The engine cooling system shall be certified by the engine manufacturer to meet cooling index requirements for a minimum ambient temperature or 110-degrees Fahrenheit.

#### **TRANSMISSION COOLER**

QTY: 1

A shell and tube transmission oil cooler shall be provided using engine coolant to control the transmission oil temperature.

The cooler shall have an aluminum shell and copper tubes.

The cooler shall be assembled using pressed in rubber tube sheets to mechanically create a reliable seal between the coolant and the oil.

No brazed, soldered, or welded connections shall be used to separate the coolant from the oil.

#### **RADIATOR CROSS MEMBER**

QTY: 1

The radiator installation shall include a radiator cross member for additional strength and durability.

This cross member shall be designed so the angle of approach is not affected.

#### **HEAVY DUTY RADIATOR SKID PLATE**

QTY: 1

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 effected.

This skid plate design shall include wire cover wing plates for additional protection to wires and hoses on each side of the radiator assembly.

The skid plate shall be painted to match the chassis.

#### **CHARGED AIR COOLER (FRONT MOUNT)**

QTY: 1

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 connections between the engine and charged air cooler, shall be made using high temperature silicone hoses rated for use in temperature up to 500°F, and heavy duty constant tension T-Bolt spring hose clamps.

#### **ENGINE FAN**

QTY: 1

A 30 inch diameter fan shall be used to move cooling air through the radiator. It shall have eleven (11) blades to minimize noise while providing maximum airflow and dynamic balance. It shall be made of nylon for strength and corrosion resistance.

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

A fan shroud and baffling shall be provided to direct air flow and minimize hot air recirculation during operation. The shroud shall be formed with curved surfaces to improve air flow and cooling.

#### **COOLANT RECOVERY**

QTY: 1

A coolant recovery system shall be provided and located near the battery box.

#### **HEATER AND COOLANT HOSES/PIPING**

QTY: 1

All coolant piping shall be powder coated steel tubing and formed hose barbs.

All engine enclosed connections between coolant pipes shall be made using silicone hoses rated from - 60F to+500F.

The connections will use constant torque hose clamps. Continental Blue Xtreme blue heater hoses shall be furnished for the heater system.

#### **LOW COOLANT INDICATOR**

QTY: 1

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.

#### **TRANSMISSION**

QTY: 1

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
- Direct Gear (Pumping) 4th (Lock-up)

Transmission installation shall be in accordance with the transmission manufacturer's specification.

The transmission shall be readily and easily removable for repairs or replacement.

One (1) PTO opening shall be provided on both the left and right side of the converter housing (positions one (1) o'clock and eight (8) o'clock).

**SIX (6) SPEED AUTOMATIC TRANSMISSION - 4000 SERIES**

QTY: 1

The transmission shall be calibrated for six (6) forward gears and one (1) reverse gear.

Each gear shall have the following ratios:

- First 3.51:1
- Second 1.91:1
- Third 1.43:1
- Fourth 1.00:1
- Fifth 0.74:1
- Sixth 0.64:1
- Reverse -4.80:1

**ALLISON TRANSMISSIONS TOUCH PAD SHIFTER**

QTY: 1

An illuminated, touch-pad type, shift control shall be mounted in the cab on the driver's lower wing panel.

Shift control shall be approved by the transmission manufacturer.

**TRANSMISSION OIL LEVEL SENSOR**

QTY: 1

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.

**ALLISON PARK TO NEUTRAL**

QTY: 1

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

**ALLISON PRESELECT PROGRAMMING**

QTY: 1

The transmission shall have Allison Pre select enabled to automatically downshift when the secondary engine brake is active.

**PRESELECT PROGRAMMED FOR 4TH GEAR**

QTY: 1

The transmission shall be programmed to automatically downshift to 4th gear.

This feature shall be enabled/disabled with the main on/off switch for the engine brake.

**TES 295 SYNTHETIC TRANS FLUID 4000 EVS**

QTY: 1

TES 295 transmission fluid shall be utilized to fill the 4000 EVS transmission.

**TRANSMISSION LOCK-UP**

QTY: 1

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.

A positive braking system shall be provided to prevent vehicle movement during pumping operations.

The air brakes furnished must satisfy this requirement.

### **DRIVE LINES**

QTY: 1

Drive lines shall be Dana (Spicer) 1810 heavy duty series or equal, with "glide coat" splines on all slip shafts.

The manufacturer shall utilize an electronic type balancing machine to statically and dynamically balance all drive shafts.

The manufacturer shall provide proof of compliance with all drive shaft manufacturer's standards and specifications. {No Exceptions}

Where applicable, the universal joints shall be the half loop style joints.

### **DIESEL EXHAUST FLUID LEVEL GAUGE**

QTY: 1

Diesel Exhaust Fluid level (E-1/2-F); low fuel level warning @ 1/8 tank

### **DEF TANK**

QTY: 1

A ten (10) gallon diesel exhaust fluid (DEF) tank shall be provided and installed. The tank shall be mounted in the area of the battery box and shall be accessible through a door in the crew area step well.

The tank shall include an internal heater that will be fed by engine coolant directly from the engine block to ensure it is always kept at the proper temperature per EPA requirements. The tank shall include a temperature sensor to control the flow of the engine coolant from the heater valve to the DEF tank.

A DEF fluid level sensor shall be provided with the DEF tank and connected to the level gauge on the dashboard.

### **EXHAUST SYSTEM**

QTY: 1

The exhaust system shall be installed in accordance with the engine manufacturer's requirements and meet all Environmental Protection Agency and State noise level requirements.

Exhaust system components shall be securely mounted and easily removable.

The diesel particulate filter/muffler shall be fabricated from stainless steel and of a size compatible with the engine exhaust discharge.

Exhaust tubing shall be a minimum of 16 gauge stainless steel from the turbocharger on the engine to the inlet of the diesel particulate filter. 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.

An exhaust diffuser shall be provided to reduce the temperature of the exhaust as it exits the tailpipe.

If the electrical system is hardwired or V-Mux multiplex, separate "regeneration" enable and prohibit switches shall be provided under the dash board on the driver's side. Each switch shall be provided with a spring loaded protective cover and shall be clearly marked as to function. If the electrical system is Class-1 ES-key, the regeneration switches shall be incorporated into the ultra-view screen.

The vehicle shall be equipped with SCR technology that uses a urea based diesel exhaust fluid (DEF) and a catalytic converter to significantly reduce oxides of nitrogen (NOx) emissions.

The SCR system shall reduce levels of NOx (oxides of nitrogen emitted from engines) by injecting small quantities of diesel exhaust fluid (DEF) into the exhaust upstream of a catalyst, where it vaporizes and decomposes to form ammonia and carbon dioxide.

#### **TAILPIPE**

QTY: 1

The exhaust tailpipe extending from the SCR catalyst to the side of the vehicle shall be constructed from 16-gauge stainless steel tubing.

The exhaust discharge shall be on the officer side of the apparatus forward of the rear axle.

#### **FUEL TANK**

QTY: 1

Fuel tank shall be a minimum of sixty-five (65) gallon capacity. It shall have a minimum, fuel filler neck of 2" ID and 1/4 turn fill cap. A 1/2" minimum diameter drain plug shall be provided. The tank shall be fabricated from hot rolled, pickled and oiled steel. Provisions for an additional feed line and fuel level float shall be provided for future 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. The fuel tank shall be able to withstand a longitudinal acceleration of -23.0g at 0.166 seconds in accordance to SAE J211 standards using a channel frequency class 600 filter. Testing shall be performed at and verified by a third party testing and evaluation center.

#### **STAINLESS STEEL FUEL TANK STRAPS**

QTY: 1

The straps supporting the diesel fuel tank shall be made of Type 304L stainless steel with grade 8, zinc coated steel hardware.

There will be no exceptions.

#### **FUEL TANK MOUNTING STRAP ISOLATION MATERIAL**

QTY: 1

The fuel tank mounting straps shall utilize dense rubber between the straps and the fuel tank to prevent chaffing.

#### **FUEL LINES**

QTY: 1

Fuel lines shall be an Aeroquip FC332 AQP Series fiber reinforced hose. The lines shall be sized to meet engine manufacture's requirements, and shall be carefully routed and secured along the inside of the frame rails.

#### **FUEL-WATER SEPARATOR**

QTY: 1

A fuel filter/water separator shall be provided in the fuel system.

A "water in fuel" indicator shall be provided on the information center.

#### **FUEL POCKET**

QTY: 1

A fuel fill shall be provided in the driver and officer side rear wheel well areas.

A Signature 4 composite fuel pocket with a brushed stainless steel door shall be provided.

A tethered cap shall be provided as part of the assembly.

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

### **PUMPER BODY ELECTRICAL**

QTY: 1

### **CHASSIS ELECTRICAL SYSTEM**

QTY: 1

All electrical wiring in the chassis shall be GXL 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 thermal automatic reset 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 in custom construction.

The power distribution centers are function oriented. The first is to control major truck function. The second shall control center to overhead switching and interior operations. Each module is single function coded and labeled to aid in troubleshooting. The centers will 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.

### **12 VOLT ELECTRICAL SYSTEM TESTING**

QTY: 1

The apparatus low voltage electrical system shall be tested and certified by the manufacturer. The certification shall be provided with the apparatus. All tests shall be performed with the 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.

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.

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.

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 fewer than 11.7 volts DC for a 12-volt system, for more than 120 seconds, shall be considered a test failure.

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 fewer than 11.7 volts shall be considered a test failure. The battery system shall then be able to restart the engine.

At the 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.

#### **CHASSIS WIRING INSTALLATION**

QTY: 1

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

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

All circuits shall conform to SAEJ2202. All circuits must be provided with low voltage over current protective devices.

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

#### **DIRECT BATTERY GROUNDING STRAP**

QTY: 1

If the electrical system requires, 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**

QTY: 1

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.

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.

### **SEQUENCER**

QTY: 1

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.

### **MULTIPLEX CONTROL PUMP SHIFT SWITCH - MULTIPLEX**

QTY: 1

The pump shift control shall be a Mil Spec toggle switch with mechanical detents mounted in a fully backlit panel that shall have indicators for "Pump Engage" and "Ok To Pump".

The mode of the transfer case shall be controlled by remotely mounted air solenoids which shall be activated and monitored through the chassis control logic of the multiplex system.

### **MULTIPLEX ELECTRICAL SYSTEM**

QTY: 1

A multiplex electrical management system shall be utilized on the chassis for all functions applicable.

The system shall consist of the following components:

A computer interface used to not only program the multiplex system but also serve as a factory direct gateway into the vehicle from any authorized service facility.

A Universal System Manager (USM), which acts as the main controlling component of the multiplexing system shall be provided and factory programmed to DOT, NFPA, SAE, the manufacturer and {Company} specifications. The programming shall be done by the manufacturer's engineering department.

The ES-Key system installation shall comply with SAE J551 requirements regarding Electromagnetic and Radio Frequency interference (EMI, RFI), as well as utilize components and wiring practices that insure the system is protected against corrosion, excessive temperatures, water, excessive physical, and vibration damage by any equipment installed on the vehicle at the time of delivery.

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 dillblox assemblies installed in the cab.

Diagnostic software shall be provided to download data from the on board ES-KEY system. This software shall have the ability to view system input/output (I/O) information, and include a connection from a computer to the vehicle.

#### **INTER-LOCK MODULE FOR MULTIPLEX SYSTEM**

QTY: 1

A multiplex 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 in the driver's side dash. There shall be a pump diagnostic view in the UltraView screen that shall indicate to service personnel the interlock state of the apparatus.

In the event of a multiplexing error involving pump operation, an override can be activated to ensure reliable pumping operations at ALL times.

The multiplex system shall be able to provide automatic and/or manual activation of engine "Fast Idle", to maintain adequate alternator output and thus, chassis voltage.

There will be no exceptions.

#### **ALTERNATOR**

QTY: 1

There shall be a Delco Remy Model 55SI, 430 amp brushless, serpentine belt, driven alternator.

The brushless design of the 55SI transfers magnetic fields between the rotor and stator air-gap without brushes.

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

The alternator shall carry a 3 Year/Unlimited Mile warranty.

#### **BATTERIES**

QTY: 1

Five (5) Deka, anchor bonded maintenance free batteries shall be provided.

These batteries shall be wired in parallel to the master disconnect switch.

Each battery shall be rated at 950 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 per SAEJ541.

#### **BATTERY STORAGE, STEEL**

QTY: 1

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.

The battery tray shall be able to withstand a longitudinal acceleration of -46.5g at 0.246 seconds in accordance to SAE J211 standards using a channel frequency class 600 filter.

Testing shall be performed at and verified by a third party testing and evaluation center.

#### **COLE HERSEE BATTERY JUMPER STUDS**

QTY: 1

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 back wall of the drivers step well.

Each stud shall be equipped with both a rubber protector cap and a 2" square non-conductive plate to prevent accidental shorting.

#### **BATTERY DISCONNECT SWITCH**

QTY: 1

The chassis batteries shall be wired in parallel to a single 12 volt electrical system, controlled through a heavy duty master disconnect switch.

The master disconnect switch shall be located within easy access of the driver upon entering or exiting the cab.

#### **SHORELINE INLET**

QTY: 1

One (1) Kussmaul "Super" Auto Eject automatic, 120 volt, 20 amp shoreline disconnect shall be provided for the on board, 110 volt battery charging systems.

The disconnect shall be equipped with a NEMA 5-20 P male receptacle, which shall automatically eject the shoreline when the vehicle starter is energized.

The mating connector shall be included with the auto eject and shall be provided as loose equipment.

A label shall be provided indicating voltage and amperage ratings.

#### **SHORELINE INLET COVER**

QTY: 1

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

#### **SHORELINE INLET LOCATION**

QTY: 1

The shoreline receptacle shall be located in the area directly adjacent to the driver's side cab door in a pre determined location by KME.

#### **SHORELINE INLET LABEL**

QTY: 1

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).

**BATTERY CHARGER**

QTY: 1

A Kussmaul model # 445-5265-0, EV-40, fully automatic, battery charger shall be provided for maintaining the vehicle battery system.

The charger shall feature Smart circuitry to provide three stages of charging: bulk, absorption, and float.

The charger shall have a battery type selector switch that regulates the proper charge/float voltage.

In addition to the main battery output, the charger shall also have auxiliary, 15 amp, output terminal with a battery saver selector switch to power accessory loads.

Output current of the charger shall be 40 amperes @ 12 volt DC.

**BATTERY CHARGER STATUS CENTER**

QTY: 1

A Kussmaul # 091-189-12 universal single indicator shall be installed to monitor the battery voltage and indicate the following conditions of the battery via LED's: Hi Voltage, Fully Charged,

Charging and Low Voltage. In addition to the LED status indicators, a 3-digit indicator shall display the battery voltage.

The status center shall be located near the shoreline disconnect receptacle unless otherwise specified.

**BLUE SEA #4365 ACCESSORY PANEL**

QTY: 1

A Blue Sea model 4365 accessory panel wired to direct battery power will be provided. The accessory panel shall include one (1) 12-volt power port, Two (2) dual USB charging ports, along with a power switch with built in circuit breaker.

The accessory panel shall be mounted in the center dash panel.

**POWERWERX USB/USB-C CHARGING PORT IN REAR CREW AREA**

QTY: 3

A Poerwerx USB charging port wired to direct battery power shall be installed in the cab of the truck for fire department accessory devices.

The port shall have two (2) USB connections, one (1) USB and one (1) USB-C.

The port shall be located in the rear crew area, on the rear of the doghouse.

**POWER AND GROUND STUD FOR ACCESSORIES IN DASH**

QTY: 1

One (1) dedicated circuit; 12 volt, 40 Amp, power and ground on 3/8 stud and fused at battery shall be provided in the cab dash.

The circuit shall be for future installation of radios or accessories.

**BLUE SEA FUSE BLOCK - 12 CIRCUIT BEHIND OFFICER SE**

QTY: 1

A Blue Sea 5026B, 12 circuit fuse block, shall be installed behind the officers seat.

This block has a maximum amperage of 60 amps per block and 30 amps per circuit and shall be connected to battery direct power.

#### **IGNITION STUD - REAR CREW AREA**

QTY: 1

An ignition stud shall be installed in the rear crew area for items needing an ignition circuit ( ie. mobile radio).

This stud has a maximum amperage of 20 Amps.

#### **WHELEN 6" ROUND WHITE/RED LED INTERIOR LIGHTS (4)**

QTY: 1

Four (4) Whelen # 60CREGCS, 6" round, interior LED combination red/white dome lights shall be furnished in the cab, with two (2) in the forward section and two (2) in the rear crew section.

Each dome light shall have individual switches to control the red or white LEDs.

Each dome light shall also activate when the respective, adjacent cab door is opened.

#### **ENGINE COMPARTMENT WORK LIGHTS - TECNIQ LED**

QTY: 1

Two (2) Tecniq model #E18 LED lights shall be provided inside the engine enclosure that will provide 800 lumens each.

Each light shall have their own independent switch incorporated into the light head.

#### **DASH & CENTER CONSOLE - 100" PREDATOR SS**

QTY: 1

Where standard features are controlled through physical switches they will be indicated as such in the appropriate part of this specification. All optional features that are controllable from the cab will be controllable through the display screen.

The dash consoles shall be custom formed overlaid aluminum housings to create an ergonomically designed interior that will be user friendly and functional for the driver and officer.

The cab instruments and controls will be labeled with international symbols and located in the following zones:

- **Driver Gauge Left:** Located to the left of the instrument panel, this zone houses the ignition, engine start, and fast idle switches.
- **Driver Gauge Right:** Located to the right of the instrument panel, this zone houses power take-off and ladder power switches when those features are specified.
- **Driver Knee Left:** Located at the driver's left knee area, this zone is the standard location for pump controls, and for the Engine Emergency Shut-Down when specified.
- **Driver Knee Right:** Located at the driver's right knee area, this zone houses optional chassis related switches such as the Fuel Priming Pump, Engine Fan Override, and ATC Disable.
- **Driver Lower Wing:** Located on the engine tunnel and angled toward the driver, this zone houses the majority of the controls that the driver may need to access while operating. Within the easiest reach of the driver are the park brake, transmission shift, Vehicle Information Display, and any optional retarder controls. Standard switching in this zone includes power window controls, hazard

flasher, headlights, marker lights, and mirror adjustment. Also located in this zone will be switching for any optional features that are more likely to be used while driving such as auxiliary brakes, siren brake, drive axle locks, and automatic tire chains.

- **Center Lower:** Located on the engine tunnel between the driver and officer and parallel to the cab front, this zone houses the standard 12 volt sockets and USB chargers. It will also house any optional communications devices that are more likely to be accessed while driving such as an arrowhead controller or a stereo radio.
- **Driver Overhead:** Located in the overhead console directly above and facing the driver, this zone houses tactile switches (when specified) for control of emergency devices such as warning lights, scene lights, dump chute valves, and other emergency related items. If not specified these controls are available through the Vehicle Information Center.
- **Driver Overhead Wing:** Located in the overhead console and angled toward the driver, this zone houses the heating and air conditioning tactile switches provided as standard.
- **Center Overhead:** Located overhead between the driver and officer and parallel to the cab front, this zone houses any communications devices such as siren heads or two-way radios that cannot be fit in the Officer Lower Wing: Located on the engine tunnel and angled toward the officer, this zone houses optional feature switching as specified for control by the officer.
- **Officer Overhead Wing:** Located in the overhead console and angled toward the officer, this zone is houses optional switching or gauges that cannot be located in other zones and that is intended solely for use by the officer.
- **Officer Overhead:** Located in the overhead console directly above and facing the officer, this zone houses optional larger communications equipment that cannot be located in other zones, and that is practical for use solely by the officer.

Exact locations of each switch or control will be dictated by the Dash Layout document created during the design process and will adhere to these guidelines unless otherwise specified.

#### **CAB DASH PANELS**

QTY: 1

The apparatus cab shall be outfitted with backlit gradient dash and overhead panels. These gradient panels shall be utilized across the entire front of the cab dash and include the instrument cluster and brow panels. The panels shall be constructed from 3mm aluminum composite panels with second surface screen printed 15 mil Bayfol UV-1 polycarbonate graphic overlays, to provide scratch and UV protection. A carbon-graphite shaded graphic overlay shall be provided.

#### **CONTROL SWITCHING THROUGH MULTIPLEX TOU**

QTY: 1

Switching for the emergency and auxiliary systems shall be performed through the multiplex control screen.

Switching shall programmed through various menus that are accessible from the display buttons.

#### **HOSEBED WORKLIGHT SWITCH - RECESSED**

QTY: 1

The hose bed work light switch shall be installed in a recessed pocket.

#### **HOSE BED WORK LIGHT - SWITCH**

QTY: 1

The hose bed work light shall have a protected 12-volt switch at the rear body panel.

The switch will be labeled "HOSE BED WORK LIGHTS."

**CONTROL SWITCHES IN CAB FOR LIGHT ABOVE WINDSHIELD**

QTY: 1

Controls shall be provided in the cab control system (or optional mechanical switch) to activate the HiViz, FireTech, LED brow light.

**CONTROL SWITCHES ON PUMP PANEL FOR LIGHT ABOVE WIN**

QTY: 1

Three (3) switches shall be provided on the pump panel to control the individual lighting circuits of the HiViz, FireTech, LED brow light.

**CONTROL SWITCHES IN CAB FOR BEHIND FRONT CAB DOOR**

QTY: 1

Controls shall be provided in the cab control system (or option mechanical switch) to turn the lights at the cab doors on and off.

**CONTROL SWITCHES ON PUMP PANEL FOR BEHIND FRONT CA**

QTY: 1

Two (2) switches shall be provided on the pump panel to turn the lights at the cab doors on and off.

One (1) switch shall control the driver side light and one (1) switch shall control the officer side light.

**CONTROL SWITCH IN CAB FOR REAR OF BODY LIGHTS**

QTY: 1

Controls shall be provided in the cab control system (or optional mechanical switch) to turn the rear of body lights on and off.

**CONTROL SWITCH ON PUMP PANEL FOR REAR OF BODY LIGH**

QTY: 1

A switch shall be provided on the pump panel to turn the rear of body lights on and off.

**CONTROL SWITCH IN CAB FOR DRIVER SIDE OF BODY LIGH**

QTY: 1

Controls shall be provided in the cab control system (or optional mechanical switch) to turn the driver side of body lights on and off.

**CONTROL SWITCH ON PUMP PANEL FOR DRIVER SIDE OF BO**

QTY: 1

A switch shall be provided on the pump panel to turn the driver side of body lights on and off.

**CONTROL SWITCH IN CAB FOR OFFICER SIDE OF BODY LIG**

QTY: 1

Controls shall be provided in the cab control system (or optional mechanical switch) to turn the officer side of body lights on and off.

**CONTROL SWITCH ON PUMP PANEL FOR OFFICER SIDE OF B**

QTY: 1

A switch shall be provided on the pump panel to turn the officer side of body lights on and off.

**DRIVER'S DASHBOARD PANEL, 100" PREDATOR SS**

QTY: 1

The main instrument panel shall be centered in front of the driver and shall be mechanically fastened to the main dash assembly. The panel shall contain the primary gauges, an instrument warning light cluster and the ignition and engine start switches.

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.

### **DRIVER DASH LCD VIRTUAL DISPLAY**

QTY: 1

The main instrument panel shall be centered in front of the driver and shall have a hinged bottom with two ¼ turn latches at the top. The driver panel and all other cab interior dash and overhead panels will be an anti-glare surface.

Contained within this panel will be virtual driver display via a 12.3" LCD screen including but not limited to displaying all gauges and instrument warning light cluster functions. The upper left side of the driver dash panel shall also include an ignition-on switch, fast idle switch and a round engine start button which shall include a lighted indicator on the perimeter to light up when engine is ready to start and turning off when the engine is started.

The driver LCD virtual display shall include:

- 12.3" Color TFT Display
- Stand Alone Architecture
- Automatic Adjustment for Light Conditions
- 3 x BNC Analog Video Input
- Fully Programmable Features w/Graphical HMI:CGI Studio
- Two Year Warranty

The primary gauge display shall consist of:

- Vehicle speedometer, (0-80 mph)
- Engine tachometer, (0-3000 rpm)
- Engine oil pressure, (0-100 psi); low oil warning
- Engine coolant temperature (100-250 °F); high engine temp warning
- Transmission oil temperature (100-350 °F); high transmission fluid temp warning
- Vehicle battery voltage (0-18 VDC); low voltage warning
- 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
- Diesel Exhaust Fluid (DEF) Level (E-1/2-F)
- Air cleaner restriction gauge (0-40), warning at 25"
- Engine hours as maintained by the engine ECU

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

### **INDICATOR CLUSTER**

This display, also contained in the Driver Dash Virtual Display Module, includes 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 simulated gauges and telltales.

On the Road displays include:

- 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.

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

- "Right And Left Directional" arrows (green 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 (yellow in color)
- "Low Coolant Level" (yellow in color)
- "Water In Fuel" indicator (amber 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)
- "PTO Engaged" (green in color)
- "Ok to Pump" (green in color)
- "Auto Traction Control" (amber in color)

### **FAST IDLE**

QTY: 1

A fast idle for the electronic controlled engine shall be provided.

The fast idle shall be controlled by an ON/OFF switch on the left side of the main gauge panel.

An electronic interlock system shall prevent the fast idle from operating unless the transmission is in "Neutral" 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.

### **ENGINE COMPRESSION BRAKE CONTROLS**

QTY: 1

Engine brake controls shall be provided on the dash within easy reach of the driver.

### **CLASS-1 ES-KEY ULTRAVIEW 780 DISPLAY**

QTY: 1



A 7 inch full color display shall located on the driver's lower wing panel. The display shall provide key information and control within easy sight and reach.

The screen shall be programmed with the following features:

- Chassis Instrument Display
- Back-up Camera - Up to three cameras (Not compatible with 360 camera systems)
- Seat Occupant Display
- Compartment open display
- HVAC Controls
- Power Mirror Controls
- DPF Filter Regeneration Controls
- Warning light controls
- Scene light controls
- Horn selector switch options (This option is not available with a Smart Wheel)
- Gauge back-light dimming
- Rocker switch back-light dimming
- Display screen dimming with day/night feature
- Multiplex system diagnostics
- Generator Controls (if equipped)
- Jacks Not Stowed Warning (Aerial Trucks Only)

#### **PUMP SHIFT CONTROL**

QTY: 1

The pump shift control and pump engaged indicator light shall be mounted in the driver's lower left knee panel.

#### **CAMERA SYSTEM**

QTY: 1

An FRC model BCA110-A00 backup camera shall be provided.

#### **CAMERA SYSTEM**

QTY: 1

An FRC side vision camera shall be provided to allow the driver to visually see the officer side of the apparatus while in the cab.

The side vision camera shall be mounted on the officer side of the cab and shall be wired to automatically activate when the right turn signal is activated unless the chassis is placed in reverse in which case the backup camera will activate.

#### **CAMERA SYSTEM**

QTY: 1

One (1) formed aluminum diamond plate shield shall be provided and mounted over the rear view camera to protect it from being damaged.

#### **CAMERA SYSTEM**

QTY: 1

The video output from the camera(s) shall be displayed on the Ultraview, display panel.

#### **CUST CHASSIS LED MARKER LIGHTS**

QTY: 1

DOT MARKER LIGHTS AND REFLECTORS

**CAB STEP LIGHTS, TECNIQ EON 3 LED, ALL DEVICES**

QTY: 4

Polished, stainless steel, TecNiq Eon, 3-LED, horizontal surface mounted chassis step lights shall be provided and controlled with marker light actuation and park brake application.

Step lights shall be located to properly illuminate all chassis access steps and walkway areas and shall include a mounting gasket to provide a watertight seal.

**DUAL MODULE W/ WHELEN M6 LED TURN SIGNAL & REQ WAR**

QTY: 1

Two (2) Whelen M6T, 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.

**ALTERNATE FLASHING HEADLIGHT SYSTEM (WIG-WAGS)**

QTY: 1

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.

The alternating flashing system shall be automatically disabled during the "Blocking Right of Way" mode.

**DUAL HEADLIGHTS LED FIRETECH HIVIZ**

QTY: 1

Two (2) dual, Firetech HiViz LED headlight modules with a bright finish bezel shall be furnished, one (1) each side, on the front of the cab. Each head light module shall incorporate an individual LED low beam and a LED high beam headlight. High beam actuation shall be controlled on the turn signal lever.

**DAYTIME RUNNING LIGHTS**

QTY: 1

The chassis head lights shall have integrated circuitry to actuate the low beam headlights whenever the chassis engine is running.

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

**FRONT BROW LIGHT**

QTY: 1

One (1) HiViz LEDs "FireTech" Scene light, model FT-B-72-ML-W shall be provided.

The light instrument shall be low in profile with a mounting bracket allowing installation at the top edge of the windshield.


The housing shall be made of a extruded 6061 aluminum; 72" wide and less than 3" tall.

The scene light shall have 57 LEDs divided amongst 3 independent circuits; circuit one featuring 9x 5w LEDs passing light through a 10 degree optic, circuit two featuring 18x 5w LEDs passing light through a 25-40 degree "flood" range, and circuit three featuring 30x 5w LEDs passing light through a 60-90 degree "scene" optic.

Circuit four shall consist of 5 amber colored diodes that act as SAE-J2042 compliant clearance marker and identification lamps.

The circuitry shall feature a PWM LED driver with an onboard electronic thermal manager. Additionally, the bar shall meet CISPR25 EMI requirements.

The light shall operate on 12v DC, generate 28,101 lumens and draw 24 amps. The light shall be adjustable vertically up to 15 degrees.

Mounting shall be possible in any direction while still meeting NFPA 1901 compliance requirements. The housing color shall be  White.

**WIRE UPGRADE FOR 12V HIGH AMP LIGHT - (1) BROW LIG**

QTY: 1

**NFPA COMPLIANT WARNING LIGHT PACKAGE**

QTY: 1

The following warning light package shall include all of the minimum warning light and actuation requirements for the current revision of the NFPA 1900 Fire Apparatus Standard.

The lighting as specified shall meet the requirements for both "Clearing Right of Way" and "Blocking Right of Way" which includes disabling all white warning lights when the apparatus is in "Blocking Right of Way" mode.

**WARNING LIGHT FLASH PATTERN - NFPA FLASH PATTERN**

QTY: 1

All of the perimeter warning lights shall be set to a default NFPA compliant flash pattern as provided by the light manufacturer.

**LIGHT PACKAGE ACTUATION/CONTROLS**

QTY: 1

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.

**LIGHT PACKAGE NFPA CERTIFICATION**

QTY: 1

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"

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 1900 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.

Any large truck as defined by NFPA shall have the lower zone warning lights mounted no higher than 62" to the optical center of the warning light from ground level. {No Exceptions}

**LIGHTS BAR**

QTY: 1

A Whelen # F4N9QLED "Edge Freedom Series IV", 92" cab roof warning light bar shall be furnished and rigidly mounted on top of the cab roof.

The light bar shall be equipped with the following:

- Clear Lenses
- Two Front Corner Red Linear LEDs
- Two Red Forward Facing Linear LEDs
- Two White Forward Facing Linear LEDs
- Two Red End Linear LEDs.

If equipped, the forward facing white lights shall be automatically disabled for the "Blocking Right of Way" mode.

**ZONE A WARNING LIGHTS - STEADY BURN IN LIGHTBAR**

QTY: 1

**C-UPPER, WHELEN M9 SUPER LEDS**

QTY: 1

Two (2) Whelen, M9\* super LED light heads shall be furnished and mounted one (1) on each side on the upper rear face of the body, facing rear.

**UPPER ZONE C WARNING LIGHT LENS - RED**

QTY: 1

The upper zone C warning lights shall include red LEDs and a red lens if available from the manufacturer. If a red lens is unavailable, a clear lens shall be included.

**UPPER ZONE C WARNING LIGHT BEZEL - CHROME**

QTY: 1

The upper zone C warning lights shall include a chrome bezel if available from the manufacturer. If a chrome bezel is unavailable, a black bezel shall be included.

**B/D-UPPER FRONT, WHELEN M9 SUPER LEDS**

QTY: 1

Two (2) Whelen, M9\*, super LED light heads shall be furnished and mounted one (1) on each side on the upper side face, towards the front of the body, facing to each side of the unit.

**UPPER ZONE B/D FRT WARNING LIGHT LENS - RED**

QTY: 1

The upper zone B/D front warning lights shall include red LEDs and a red lens if available from the manufacturer. If a red lens is unavailable, a clear lens shall be included.

**UPPER ZONE B/D FRT WARNING LIGHT BEZEL - CHROME**

QTY: 1

The upper zone B/D front warning lights shall include a chrome bezel if available from the manufacturer. If a chrome bezel is unavailable, a black bezel shall be included.

**B/D-UPPER REAR, WHELEN M9 SUPER LEDS**

QTY: 1

Two (2) Whelen, M9\*, super LED light heads shall be furnished and mounted one (1) on each side on the upper side face, towards the rear of the body, facing to each side of the unit.

The lights shall be installed with a chrome plated mounting flange.

**UPPER ZONE B/D REAR WARNING LIGHT LENS - RED**

QTY: 1

The upper zone B/D rear warning lights shall include red LEDs and a red lens if available from the manufacturer. If a red lens is unavailable, a clear lens shall be included.

**UPPER ZONE B/D REAR WARNING LIGHT BEZEL - CHROME**

QTY: 1

The upper zone B/D rear warning lights shall include a chrome bezel if available from the manufacturer. If a chrome bezel is unavailable, a black bezel shall be included.

**A-LOWER FRONT MOUNTING, CUSTOM CHASSIS**

QTY: 1

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

**A-LOWER FRONT, WHELEN M6 SUPER LEDS**

QTY: 1

Two (2) Whelen, M6\* super LED light heads shall be provided and installed one (1) each side.

**LOWER ZONE A WARNING LIGHT LENS - RED**

QTY: 1

The lower zone A warning lights shall include red LEDs and a red lens if available from the manufacturer. If a red lens is unavailable, a clear lens shall be included.

**LOWER ZONE A WARNING LIGHT BEZEL - CHROME**

QTY: 1

The lower zone A warning lights shall include red leds and a chrome bezel if available from the manufacturer. If a chrome bezel is unavailable, a black bezel shall be included.

**C-LOWER REAR, WHELEN M6 SUPER LEDS**

QTY: 1

Two (2) Whelen M6\* super LED light heads shall be provided and installed with one (1) on each side directly below the DOT stop, tail, turn and backup lights.

**LOWER ZONE C WARNING LIGHT LENS - RED**

QTY: 1

The lower zone C warning lights shall include red LEDs and a red lens if available from the manufacturer. If a red lens is unavailable, a clear lens shall be included.

**B/D-LOWER FRONT MOUNTING, CUSTOM CHASSIS**

QTY: 1

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

**B/D-LOWER FRONT, WHELEN M6 SUPER LEDS**

QTY: 1

Two (2) Whelen, M6\* super LED light heads shall be provided and installed with one (1) on each side.

**LOWER ZONE B/D FRONT WARNING LIGHT LENS - RED**

QTY: 1

The lower zone B/D front warning lights shall include red LEDs and a red lens if available from the manufacturer. If a red lens is unavailable, a clear lens shall be included.

**LOWER ZONE B/D FRONT WARNING LIGHT BEZEL - CHROME**

QTY: 1

The lower zone B/D front warning lights shall include a chrome bezel if available from the manufacturer. If a chrome bezel is unavailable, a black bezel shall be included.

**B/D-LOWER MID, WHELEN M6 SUPER LEDS**

QTY: 1

Two (2) Whelen M6\* super LED light heads shall be provided and installed with one (1) on each side.

**LOWER ZONE B/D MID WARNING LIGHT LENS - RED**

QTY: 1

The lower zone B/D mid warning lights shall include red LEDs and a red lens if available from the manufacturer. If a red lens is unavailable, a clear lens shall be included.

**LOWER ZONE B/D MID WARNING LIGHT BEZEL - CHROME**

QTY: 1

The lower zone B/D mid warning lights shall include a chrome bezel if available from the manufacturer. If a chrome bezel is unavailable, a black bezel shall be included.

**B/D-LOWER REAR, WHELEN M6 SUPER LEDS**

QTY: 1

Two (2) Whelen M6\* super LED light heads shall be provided and installed with one (1) on each side.

**LOWER ZONE B/D REAR WARNING LIGHT LENS - RED**

QTY: 1

The lower zone B/D rear warning lights shall include red LEDs and a red lens if available from the manufacturer. If a red lens is unavailable, a clear lens shall be included.

**LOWER ZONE B/D REAR WARNING LIGHT BEZEL - CHROME**

QTY: 1

The lower zone B/D rear warning lights shall include a chrome bezel if available from the manufacturer. If a chrome bezel is unavailable, a black bezel shall be included.

**PAIR OF WHELEN 21.5" - "F4NMINI" LED LIGHT BARS, S**

QTY: 1

A pair of Whelen model F4NMINI, 21.5" Freedom, cab roof warning light bars shall be furnished and rigidly mounted with one (1) on each side on the cab roof facing to each side of the unit. Each light bar shall be equipped with the following:

Clear Lenses:

- Two Corner Red Linear LEDs
- One White Forward Facing LED
- One Red Side Facing LED If equipped, the white lights shall be automatically disabled for the "Blocking Right of Way" mode.

The lights specified above shall be provided in addition to the NFPA required Optical Warning Light Package.

Additionally, wiring for the shall be run through the Load Management System to ensure that the electrical system is not overloaded by the additional amperage draw requirements.

**3M OPTICOM - MOUNTED IN CAB ROOF LIGHT BAR**

QTY: 1

One (1) 3M Opticom system, which produces a flashing optical signal when in operation, shall be provided and mounted inside the cab roof light bar, replacing the center mounted clear warning light and situated so as not to interfere with the required light patterns of the NFPA Optical Warning Light System.

Controls for the system shall be provided independently of the Optical Warning Light System, with the wiring run through the Load Management System at the lowest available priority.

Additional circuitry shall be provided to automatically disable the Opticom System when the parking brake is engaged.

**GROUND LIGHTS**

QTY: 1

One (1) TecNiq LED, 6" long ground light with stainless steel mounting bracket, 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.

**GROUND LIGHTS BELOW PUMP PANEL RUNNING BOARD**

QTY: 1

One (1) TecNiq LED, 6" long ground light with stainless steel mounting bracket, shall be provided under each side pump panel running board, two (2) total.

**GROUND LIGHTS REAR BODY CORNERS**

QTY: 1

One (1) TecNiq LED, 6" long ground light with stainless steel mounting bracket, shall be provided under each rear body corner, two (2) total.

**CAB AND BODY GROUND LIGHTS ACTIVATE WITH MASTER SW**

QTY: 1

The ground lights shall be activated by a master ground light switch in the cab and shall be wired through the load management system.

**CHASSIS DIAGNOSTICS SYSTEM**

QTY: 1

Diagnostic ports shall be accessible while standing on the ground and located inside the driver's 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:

- A single port to monitor the engine, transmission and ABS system and diagnostics of the roll sensor (if applicable)
- Engine diagnostic switch (blink codes)
- ABS diagnostic switch (blink codes)
- Allison Transmission Codes (through touch pad shifter)

**VOLTAGE MONITORING SYSTEM - 12 VOLT**

QTY: 1

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**

QTY: 1

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

### **ELECTRICAL HARNESS INSTALLATION - 12 VOLT**

QTY: 1

To ensure dependability, all 12-volt wiring harnesses installed by the 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 1900 - 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 its mounting location. Routing of harnessing which requires pulling of wires through tubes is never allowed at the manufacturer.

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 Exceptions} 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 require 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.

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 1900 - 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.

## **BODY ELECTRICAL SYSTEM**

QTY: 1

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 1900.

#### **BODY ELECTRICAL HARNESS - ES-KEY**

QTY: 1

#### **POWER DISTRIBUTION MODULES FOR CLASS ONE ES-KEY**

QTY: 1

Class 1 Power distribution modules shall be provided in strategic areas of the chassis to allow body harnesses to interface to multiplex system.

The Remote Power Modules (RPM) provide a method of controlling loads on the vehicle, outside the cab, without running individual wires from each switch to the load.

This electronic module distributes and controls power to various devices on the vehicle as commanded by the control system inside the cab.

The RPM is connected to the Electrical System Controller via the J1939 datalink.

Each module receives power from a power cable, protected by a fusible link to the main battery circuit.

The power distribution modules shall be mounted in a location to provide complete access for service or trouble shooting.

#### **DOOR OPEN INDICATOR W/ INTEGRAL AUDIBLE ALARM**

QTY: 1

An indicator light with an 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.

#### **DUNNAGE AREA LIGHTING**

QTY: 1

Two (2) stainless steel, TecNiq Eon 3-LED horizontal surface mounted lights shall be provided in the dunnage area to provide adequate illumination of this area.

These lights shall be switched in the same manner as the step lights.

#### **COMPARTMENT LIGHT ACTIVATION**

QTY: 1

Compartment lighting shall be switched either from an integral switch as provided by the roll up door manufacturer or a magnetic proximity switch if it is a KME manufactured door.

#### **COMPARTMENT LIGHTS**

QTY: 7

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

**ROOF COMPARTMENT LIGHTS**

QTY: 6

A Amdor Luma Bar LED strip compartment light(s) shall be provided, to ensure proper compartment illumination.

The lights shall be mounted underneath the roof compartment door opening and shall be activated with a magnetic door switch that shall be connected to the door ajar warning circuit.

**CUST BODY LED MARKER LIGHTS**

QTY: 1

**DOT MARKER LIGHTS FORWARD OF CAB DOOR**

QTY: 1

Amber LED DOT marker lights with reflector shall be provided and mounted forward of the front cab door, one (1) each side.

**MARKER/TURN LIGHTS @ EA SIDE OF BODY**

QTY: 1

Red, LED marker lights with integral reflectors shall be provided at the lower side rear, having one (1) on each side.

Yellow, LED side marker and turn lights shall be provided on the apparatus lower side, forward of rear axle that puts one (1) on each side, if the apparatus is 30' long or longer.

**DOT MARKER LIGHTS @ REAR OF BODY**

QTY: 1

Red, LED clearance lights shall be provided on the apparatus rear upper having one (1) on each side at the outermost practical location.

Red, LED, 3-lamp identification bar will be provided on the apparatus rear center.

**DOT AMBER REFLECTORS @ SIDE OF BODY**

QTY: 1

Yellow reflectors shall be provided on the apparatus body lower side, as far forward and low as practical with one (1) on each side if the apparatus is 30' long or longer.

**DOT RED REFLECTORS @ REAR OF BODY**

QTY: 1

Red reflectors shall be provided on the apparatus rear with one (1) on each side at the outermost practical location.

**TECNIQ #L10 LED LICENSE PLATE LIGHT**

QTY: 1

One (1) Tecniq model #L10 LED license plate light shall be provided above the mounting position of the license plate. The license plate shall be located on the driver's side rear of body.

The light shall be clear in color and shall have a chrome finish.

**WHELEN #M6 LED BRAKE, REVERSE, & TURN W/ QUAD HOUS**

QTY: 1

Two (2) Whelen M6 series, 4-5/16" x 6-3/4", LED red combination tail and stop lights, shall be mounted one each side at the rear of the body.

Two (2) Whelen M6 series, 4-5/16" x 6-3/4", LED amber arrow turn signal lights, shall be mounted one each side, on a vertical plane with the tail/stop lights.

Two (2) Whelen M6 series, 4-5/16" x 6-3/4", LED white back-up lights, shall be mounted, 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.

Two (2) Whelen M6FCV4 mounting flanges, installed one (1) on each side, shall be provided to mount the lights described above in one common mounting flange.

The fourth opening shall be for the lower rear warning lights.

The lights shall be mounted in order, from top to bottom, as described above.

**BODY STEP LIGHTS, TECNIQ EON 3 LED, ALL DEVICES**

QTY: 2

Polished, stainless steel, TecNiq Eon 3-LED, horizontal surface, mounted body step lights shall be provided and controlled with marker light actuation and park brake application.

Step lights shall be located to properly illuminate all body access steps and walkway areas and shall include a mounting gasket to provide a watertight seal.

**PUMP ENCLOSURE WORK LIGHTS - TECNIQ LED**

QTY: 1

Two (2) Tecniq, model #E18 lights shall be provided inside the pump enclosure, providing 800 lumens each.

Each light shall have their own independent switch incorporated into the light head.

**WHELEN #PELCC HOSE BED LIGHTS-FRONT WALL**

QTY: 1

Two (2) Whelen model PELCC, chrome plated, surface mounted lights shall be mounted in the hose bed on the front wall to illuminate the hose bed area.

**HIVIZ GUARDIAN JUNIOR SCENE LIGHTS BEHIND CAB DOOR**

QTY: 1

Two (2) Firetech Hiviz Guardian Junior FT-GSMJR, LED scene lights shall be provided, (1) one on each side of the cab, directly behind the front cab entrance door in a chrome plated flange.

Each light shall be 7.5 wide by 5 high by 1.5 deep, draw 3.33 amps, and produce 3,000 lumens.

The scene lights shall be wired through the load management system.

**HIVIZ GUARDIAN ELITE SCENE LIGHTS ON REAR OF BODY**

QTY: 1

Two (2) Firetech Hiviz Guardian Elite FT-GESM, LED scene lights shall be provided, (1) one on each side of the rear body panel in a chrome plated flange.

Each light shall be 11 wide by 9 high by 3 deep, draw 10 amps, and produce 10,491 lumens.

The scene lights shall be wired through the load management system.

**HIVIZ GUARDIAN ELITE SCENE LIGHTS ON DS OF BODY**

QTY: 1

Two (2) Firetech Hiviz Guardian Elite FT-GESM, LED scene lights shall be provided.

The scene lights shall be installed, one rearward and one forward, on the driver side of the body in a chrome plated flange.

Each light shall be 11 wide by 9 high by 3 deep, draw 10 amps, and produce 10,491 lumens.

The scene lights shall be wired through the load management system.

**HIVIZ GUARDIAN ELITE SCENE LIGHTS ON OS OF BODY**

QTY: 1

Two (2) Firetech Hiviz Guardian Elite FT-GESM, LED scene lights shall be provided.

The scene lights shall be installed, one rearward and one forward, on the officer side of the body in a chrome plated flange.

Each light shall be 11 wide by 9 high by 3 deep, draw 10 amps, and produce 10,491 lumens.

The scene lights shall be wired through the load management system.

**REAR SCENE LIGHTS TO BE ACTIVATED BY REVERSE LIGHT**

QTY: 1

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).

**REAR TRAFFIC WARNING LIGHT**

QTY: 1

One (1) Whelen Dominator "LED Traffic Advisor", model DTA8A, 30.36" rear directional light shall be installed on the vertical rear surface of the body.

The light shall be equipped with eight (8) LED TIR3 modules.

The directional light shall be activated by a TADCTL1 control module.

The control module shall be conveniently located near the driver's position.

The rear directional light shall be wired through the load management system of the unit.

**TRAFFIC ADVISOR - RECESSED IN REAR STEP**

QTY: 1

The traffic advisor will be recessed in the rear intermediate step.

**DOT HORN**

QTY: 1

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

**BACK-UP ALARM**

QTY: 1

A Preco # 1040, self adjusting 87 thru 112dBA back-up alarm, shall be provided and installed at the rear of the apparatus under the tailboard.

The back-up alarm shall activate and automatically adjust to ambient noise levels when the transmission is placed in reverse gear and the ignition is "on."

**SINGLE CHROME AIR HORN**

QTY: 1

A single, Hadley, chrome plated air horn shall be at the front of the vehicle.

The air horn shall be mounted in full compliance with NFPA-1901.

The supply line shall be a minimum of 1/4".

**SINGLE AIR HORN**

QTY: 1

The air horn shall be recessed in the driver side of the front bumper.

**AIR HORN CONTROL**

QTY: 1

The air horn(s) shall be controlled by a floor mounted, foot switch on the officer's side.

**AIR HORN CONTROL**

QTY: 1

The air horn(s) shall be controlled through the following on the driver side.

- Floor Mounted Foot Switch
- Steering Wheel Horn Button through a Selector Switch

**ELECTRONIC SIREN**

QTY: 1

One (1) Whelen # 295HFS2, 100 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, and public address.

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

**WHELEN SA315P SPEAKER**

QTY: 1

One (1) Whelen, model # SA315P composite black siren speaker, shall be provided, recessed in the front bumper and wired to the electronic siren.

**POLISHED STEEL ELECTRONIC SIREN SPEAKER GRILL**

QTY: 1

A custom electric siren speaker grill shall be provided. This grill shall include the KME company logo cut into the center.

**MECHANICAL SIREN**

QTY: 1

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

**SIREN LOCATION**

QTY: 1

The Q2B 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.

**ELECTRO/MECHANICAL SIREN BRAKE CONTROL**

QTY: 1

A dash mounted push button switch shall be provided for the officer to control the brake on the electro/mechanical siren.

**ELECTRO/MECHANICAL SIREN BRAKE CONTROL**

QTY: 1

A dash mounted push button switch shall be provided for the driver to control the brake on the electro/mechanical siren.

**ELECTRO/MECHANICAL SIREN CONTROL**

QTY: 1

A floor mounted foot switch shall be provided for the driver to activate the electro/mechanical siren.

**ELECTRO/MECHANICAL SIREN CONTROL**

QTY: 1

A floor mounted foot switch shall be provided for the officer to activate the electro/mechanical siren.

**HALE QMAX-150 1500 GPM SINGLE STAGE PUMP**

QTY: 1

- HALE QMAX-150
- 1500 G.P.M.

Single Stage 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.

The pump shall be of a size and design to mount on the chassis rails of commercial and custom truck chassis and have the capacity of 1500 gallons per minute (U.S. GPM), NFPA-1900 rated performance.

The entire pump shall be manufactured and tested at the pump manufacturer's factory. The pump shall be driven by a drive line from the truck transmission. The engine shall provide sufficient horsepower and RPM to enable the pump to meet and exceed its rated performance. The entire pump both suction and discharge passages, shall be hydrostatically tested to a pressure of 600 PSI. The pump shall be fully tested at the pump manufacturer's factory to performance specs as outlined by the latest NFPA-1901. Pump shall be free from objectionable pulsation and vibration. The pump body and related parts shall be of fine grain alloy cast iron with a minimum tensile strength of 30,000 PSI. All moving parts in contact with water shall be of high quality bronze or stainless steel. Pumps utilizing castings made of lower tensile strength cast iron are not acceptable. Pump body shall be horizontally split, on a single plane in two sections for easy removal of entire impeller assembly including wear rings and bearings from beneath the pump without disturbing piping or the mounting of the pump in chassis.

Pump shaft to be rigidly supported by three bearings for minimum deflection. One high lead bronze sleeve bearing shall be located immediately adjacent to the impeller (on side opposite the gearbox). The sleeve bearing is to be lubricated by a force fed, automatic oil lubricated design, pressure balanced to exclude foreign material. The pump shaft shall be heat-treated, electric furnace, corrosion resistant stainless steel to be super-finished under packing with galvanic corrosion (zinc foil separators in packing) protection for longer shaft life. Pump shaft must be sealed with double-lip oil seal to keep road dirt and water out of gearbox.

The pump shall have one double suction impeller. The pump body shall have two opposed discharge volute cutwaters to eliminate radial unbalance. Pump impeller shall be hard, fine grain bronze of the mixed flow design, accurately machined, and individually balanced. The vanes of the impeller intake eyes shall be of sufficient size and design to provide ample reserve capacity utilizing minimum horsepower.

Impeller clearance rings shall be bronze, easily renewable without replacing impeller or pump volute body, and of wrap-around double labyrinth design for maximum efficiency.

### **PUMP RATIO**

QTY: 1

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 MOUNTS - MID-SHIP PUMPS**

QTY: 1

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.

### **HALE MECHANICAL PUMP SEAL**

QTY: 1

The mid ship pump shall be equipped with a high quality, spring loaded, self-adjusting mechanical seal capable of providing a positive seal to atmosphere under all pumping conditions.

This positive seal to atmosphere must be achievable under vacuum conditions up to 26 Hg (draft) or positive suction pressures up to 250 PSI.

The mechanical seal assembly shall be 2 inches in diameter and consists of a carbon sealing ring, stainless steel coil spring,

Viton rubber boot, and a tungsten carbide seat with a Teflon backup seal provided.

Only one (1) mechanical seal shall be required, located on the first stage suction (inboard) side of the pump and be designed to be compatible with a one piece pump shaft.

A continuous cooling flow of water from the pump shall be directed through the seal chamber when the pump is in operation.

### **HALE PUMP DRIVE UNIT, K GEARBOX - QMAX, QTWO**

QTY: 1

The drive unit shall be completely assembled and tested at the pump manufacturer's factory. Pump gearbox shall be of sufficient size to withstand up to 18,500 lbs. ft. of drive through torque of the engine system. The drive unit shall be designed of ample capacity for lubrication reserve and to maintain the proper operating temperature.

Gearbox housing is constructed of high strength cast iron with no structural aluminum parts. The gearbox drive shafts shall be of heat-treated chrome nickel steel and at least 2-3/4 inches in diameter, on both the input and output drive shafts. They shall withstand the full torque of the engine. All gears both drive and pump, shall be of highest quality electric furnace chrome nickel steel. Bores shall be ground to size and teeth integrated and hardened, to give an extremely accurate gear for long life, smooth, quiet running, and higher load carrying capability. An accurately cut helical high contact design shall be provided with an exclusive Anti-Hop out Design which keeps the unit firmly in the gear selected. The more torque you put to the gearbox the tougher the grip to stay in gear. There will be no exceptions.



The gearbox is equipped with a power shift with progressive engagement to assure consistent reliable shift in pump/road gear. The shifting mechanism shall be a heat treated, hard anodized aluminum power cylinder, with stainless steel shaft. An in-cab control for rapid shift shall be provided that locks in road or pump. NO speed counter shall be furnished for the K-Gearbox, by Hale or KME. Any previously mentioned speed counter will be null and void.

#### **PUMP SHIFT MANUAL OVERRIDE**

QTY: 1

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.

#### **HALE PUMP SHIFT INDICATOR LIGHTS**

QTY: 1

For automatic transmissions, three (3) green warning lights shall be provided to indicate to the operator(s) when the pump has completed the shift for Road to Pump position.

Two (2) green lights to be located in the truck driving compartment and one (1) green light on pump operator's panel adjacent to the throttle control.

For manual transmissions, one (1) green warning light shall be provided for the driving compartment.

All lights to have appropriate identification/instruction plates.

#### **HALE ANODE BLOCKS - ALLOY - 2 TOTAL**

QTY: 1

Two (2) Hale Alloy Anode blocks shall be provided and located one (1) on the suction side and one (1) on the discharge side of the pump to protect the pump from corrosion.

The Anodes shall be painted Safety Yellow for identification purposes.

#### **HALE THERMAL RELIEF VALVE - LIGHT AND BUZZER**

QTY: 1

A Hale Model TRV-L120 Thermal Relief Valve shall be provided on the pump.

If water temperature in the pump exceeds 120 degrees Fahrenheit, the thermal relief valve shall automatically open and discharge pump water to the ground, through a 3/8" discharge line, routed below the pump module. The TRV shall include a warning lamp and buzzer.

The thermal relief valve shall automatically close when the water temperature is lowered.

#### **AUXILIARY ENGINE COOLER**

QTY: 1

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 the engine. The water supply line will be equipped with a strainer.

The cooling shall be done without mixing engine and pump water.

#### **FIRE RESEARCH "PUMP BOSS" PBA400 PRESSURE GOVERNOR**

QTY: 1

The apparatus shall be equipped with a Fire Research PumpBoss model# PBA400 pressure governor and monitoring display kit. The kit shall include a control module, intake pressure sensor, discharge pressure sensor, and cables. 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. Inputs to the control module from the pump discharge and intake pressure sensors shall be electrical. 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
- Pressure and RPM operating mode LEDs
- Pressure / RPM setting; shown on a dot matrix message display
- Throttle ready LED

The 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. All LED intensity shall be automatically adjusted for day and night time operation. The program shall store the accumulated operating hours for the pump and engine to be displayed with the push of a button. It shall monitor inputs and support audible and visual warning alarms for the following conditions:

- High Battery Voltage
- Low Battery Voltage (Engine Off)
- Low Battery Voltage (Engine Running)
- High Transmission Temperature
- Low Engine Oil Pressure
- High Engine Coolant Temperature
- Out of Water (visual alarm only)
- No Engine Response (visual alarm only)

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. The governor shall operate in two control modes, pressure and RPM. No discharge pressure or engine RPM variation shall occur when switching between modes. A throttle ready, LED shall light when the interlock signal is recognized. The governor shall start in pressure mode and set the engine RPM to idle. In pressure mode the governor shall automatically regulate the discharge pressure at the level set by the operator. In RPM mode the governor shall maintain the engine RPM at the level set by the operator except in the event of a discharge pressure increase. The governor shall limit a discharge pressure increase in RPM mode to a maximum of 30 psi. Other safety features shall include recognition of no water conditions with an automatic programmed response and a push button to return the engine to idle. The pressure governor and monitoring pressure display shall be programmed to interface with a specific engine.

#### **AKRON STYLE #59 INTAKE RELIEF VALVE**

QTY: 1

A 300 psi adjustable Akron Brass model 59 intake relief valve system shall be plumbed on the suction side of the pump to comply fully with NFPA-1900 requirements.

Excess pressures shall be plumbed to discharge water under the pump enclosure away from the pump operator.

**TRIDENT "MANUAL" AIR PRIMING SYSTEM**

QTY: 1

The priming pump will be a Trident air primer system.

A push in primer handle will open the priming valve and prime the pump.

**ROTARY MASTER DRAIN VALVE**

QTY: 1

A rotary type, 12 port, master drain valve shall be provided and controlled at the lower portion of the side pump panel.

The valve shall be located in pump compartment lower than the main body and connected in such a manner as to allow complete water drainage of the pump body and all required accessories.

Water shall be drained below the apparatus body and away from the pump operator.

**DRAINS/BLEEDER "INNOVATIVE CONTROLS" LIFT UP @ ALL**

QTY: 1

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

One (1) individual "Innovative Control" lift up 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 L**

QTY: 1

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.

**SUCTION INLETS - 6" INLETS**

QTY: 1

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

A removable strainer shall be installed on each inlet.

**SHORT NECK MAIN PUMP SUCTION INLETS**

QTY: 1

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.

**BEHIND PANEL MOUNT**

QTY: 1

All side gated inlet valves shall be recess mounted behind the side pump panels or body panels. There will be no exceptions.

**6" NST INTAKE CAP - DS**

QTY: 1

A 6" NST chrome plated long handle pressure vented cap shall be installed on driver side intake.

**6" NST INTAKE CAP - OS**

QTY: 1

A 6" NST chrome plated long handle pressure vented cap shall be installed on officer side intake.

**DS MAIN INTAKE ADAPTER**

QTY: 1

One (1) 6" NHF x 4" NHF TFT AX7NP-NX adapter with plug shall be provided for the driver side main suction inlet.

**OS MAIN INTAKE ADAPTER**

QTY: 1

One (1) 6" NHF x 4" NHF TFT AX7NP-NX adapter with plug shall be provided for the officer side main suction inlet.

**FRONT SUCTION 4" NST THREADS**

QTY: 1

A 4" NST front suction inlet shall be provided at the front of the vehicle, plumbed from the pump.

**SUCT TO BE RECESSED RH SIDE OF FRONT BUMPER**

QTY: 1

The front inlet shall be located directly behind a U-shaped cutout in the front bumper in a recessed well are in the gravel shield to allow suction hose attachment with a minimal bumper extension.

The officer side front bumper storage compartment shall have drop-down front face plate for easy access to the front intake. The drop-down face plate shall be constructed from the same material as the remainder of the front bumper. The flip down face plate will be hinged at the bottom of the door and be held in place by a tab on the aluminum tread plate cover at the top..

The cutout in the bumper shall be proportional the size of the suction diameter.

**SUCT TO TERMINATE WITH 4" BRASS SWIVEL RH**

QTY: 1

The front inlet shall be located above the right hand side of the front bumper extension and shall terminate with a brass, 4" chicksan style swivel, to allow a minimum of 180 degree rotation of the inlet for suction hose attachment.

**4" NST FEMALE THREADS ON FRONT SUCTION**

QTY: 1

The front suction pipe shall be equipped with a chrome, 4", NSTF swivel thread adapter.

**FRONT SUCTION, PLUMBING, 4" STAINLESS STEEL PIPING**

QTY: 1

The front inlet shall be plumbed utilizing 4", schedule 10 stainless steel piping, 45 degree elbows and a limited number of 90 degree sweep elbows in an assembly from the pump to the front of the cab.

A manual drain shall be provided ahead of the front wheel and a panel controlled drain shall be provided aft of the front wheel.

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

**HALE MIV BUTTERFLY VALVE FOR FRONT SUCTION**

QTY: 1

The front suction plumbing shall be fitted with a Hale Master Intake Valve (MIV), 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 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 incorporate NFPA compliance, large diameter hose air bleed valve, controlled at the operator's panel.

**HALE MIV ELECTRIC VALVE - FRONT SUCTION CONNECTIO**

QTY: 1

The front suction valve shall be operated by a twelve (12) volt DC motor, controlled form the pump operator's panel.

It shall also incorporate a manual override, mounted at the valve.

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 shall not be able to move from fully open to fully closed in under three (3) seconds, in compliance with NFPA-1901.

**4" NST FRONT PRESSURE VENTED SUCTION CAP**

QTY: 1

A 4", NST chrome plated long handle pressure vented cap(s) shall be installed on front suction.

**2-1/2" DS AUX SECONDARY SUCTION INLET REAR OF M**

QTY: 1

One (1) 2-1/2" auxiliary suction shall be provided at the driver side pump panel, to the rear of the main inlet (if space and other components allow).

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.

**2-1/2" AKRON #8800 S.S. BALL VALVE, DS REAR AUX SU**

QTY: 1

An Akron Brass 2 1/2" Generation II Swing-Out Valve shall be provided for the driver's side rear auxiliary suction.

The valve shall have an all brass body with flow optimizing stainless steel ball and dual polymer seats.

**SWING CONTROL @ VALVE, DS REAR AUX SUCTION**

QTY: 1

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

**2-1/2" OS AUX SECONDARY SUCTION INLET REAR OF M**

QTY: 1

One (1) 2-1/2" auxiliary suction shall be provided at the officer side pump panel, to the rear of the main inlet (if space and other components allow).

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.

**2-1/2" AKRON #8800 S.S. BALL VALVE, OS AUX SUCTION**

QTY: 1

An Akron Brass 2 1/2" Generation II Swing-Out Valve shall be provided for the officer's side auxiliary suction.

The valve shall have an all brass body with flow optimizing, stainless steel ball and dual polymer seats.

**SWING CONTROL @ VALVE, OS AUX SUCTION**

QTY: 1

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

**TANK TO PUMP**

QTY: 1

One (1) 4" 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.

**3" AKRON #8800 SERIES - S.S. BALL, VALVE , TANK TO**

QTY: 1

An Akron Brass 3" Generation II Swing-Out Valve shall be provided between the pump suction manifold and the water tank.

The valve shall have an all brass body with flow optimizing, stainless steel ball and dual polymer seats.

**3" PUSH/PULL CONTROL FOR TANK TO PUMP**

QTY: 1

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

**TANK FILL LINE 2" FROM PUMP - SIDE MOUNT**

QTY: 1

One (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" high pressure hose for tank connection to accommodate flexing between components. There will be no exceptions.

**2" AKRON #8800 SERIES - S.S. BALL TANK FILL, SIDE**

QTY: 1

An Akron Brass 2" Generation II Swing-Out Valve shall be provided between the pump discharge manifold and the water tank.

The valve shall have an all brass body with flow optimizing, stainless steel ball, and dual polymer seats.

**PUSH/PULL CONTROL FOR TANK FILL**

QTY: 1

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

**DS MAIN DISCHARGE #1**

QTY: 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.

**2-1/2" AKRON #8800 SERIES - S.S. BALL, DS #1**

QTY: 1

An Akron Brass 2 1/2" Generation II Swing-Out Valve shall be provided for the driver's side #1 discharge.

The valve shall have an all brass body with flow optimizing stainless steel ball and dual polymer seats.

**DS #1 DISCH - 2-1/2" STRAIGHT NST & 30-DEGREE NST**

QTY: 1

The discharge valve shall be equipped with a straight 2 1/2" NST adapter that shall be equipped with a 2 1/2" NST, 30-degree, chrome plated elbow.

**2-1/2" NST PRESSURE VENTED CAP - DS DISCHARGE #1**

QTY: 1

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

**SWING 1/4 TURN CONTROL FOR DS DISCHARGE #1 -SIDE M**

QTY: 1

The driver's side # 1 discharge valve shall be controlled by a 1/4 turn swing control handle located on the operator's panel.

**CLASS ONE LIQUID FILLED 2-1/2" PRESS GAUGE - DS DI**

QTY: 1

The driver's side # 1 discharge shall be equipped with a Class One Sub-Z II, 2.5", interlube 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.

**DS MAIN DISCHARGE #2**

QTY: 1

A discharge shall be provided and located at the driver's side pump panel.

The driver's side discharges # 2 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.

**2-1/2" AKRON #8800 SERIES - S.S. BALL, DS #2**

QTY: 1

An Akron Brass 2 1/2" Generation II Swing-Out Valve shall be provided for the driver's side #2 discharge.

The valve shall have an all brass body with flow optimizing stainless steel ball and dual polymer seats.

**DS #2 DISCH - 2-1/2" STRAIGHT NST & 30-DEGREE NST**

QTY: 1

The discharge valve shall be equipped with a straight 2 1/2" NST adapter that shall be equipped with a 2 1/2" NST, 30-degree, chrome plated elbow.

**2-1/2" NST PRESSURE VENTED CAP - DS DISCHARGE #2**

QTY: 1

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

**SWING 1/4 TURN CONTROL FOR DS DISCHARGE #2 -SIDE M**

QTY: 1

The driver's side # 2 discharge valve shall be controlled by a 1/4 turn swing control handle located on the operator's panel.

**CLASS ONE LIQUID FILLED 2-1/2" PRESS GAUGE - DS DI**

QTY: 1

The driver's side # 2 discharge shall be equipped with a Class One, Sub-Z II, 2.5", interlube 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.

**OS MAIN DISCHARGE #1**

QTY: 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.

**4" AKRON #8840 VALVE, OS #1, SIDE MOUNT**

QTY: 1

An Akron Brass, 4" Heavy Duty, Swing-Out Valve shall be provided for the officer's side #1 discharge.

The valve shall have an all brass body with flow optimizing, flat ball, and dual polymer seats

**OS #1 DISCH - 4" STRAIGHT NST & 30-DEGREE NST ELBO**

QTY: 1



The discharge valve shall be equipped with a straight, 4" NST adapter that shall be equipped with a 4" NST, 30-degree, chrome plated elbow.

**4" NST PRESSURE VENTED CAP - OS DISCHARGE #1**

QTY: 1

A 4" NST, chrome plated, pressure vented cap shall be installed on officer's side # 1 discharge.

**AKRON HANDWHEEL GEAR VALVE CONTROL, OS DISCHARGE #**

QTY: 1

The officer's side # 1 discharge valve shall be gated with an Akron Hand wheel controlled, inline valve.

The valve shall be controlled at the pump operator's panel with a chrome plated hand wheel and mechanical valve position indicator.

**CLASS ONE LIQUID FILLED 2-1/2" PRESS GAUGE - OS DI**

QTY: 1

The officer's side, # 1 discharge shall be equipped with a Class One, Sub-Z II, 2.5", interlube 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

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**OS MAIN DISCHARGE #2**

QTY: 1

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.

**2-1/2" AKRON #8800 SERIES - S.S. BALL, OS #2, SIDE**

QTY: 1

An Akron Brass, 2 1/2" Generation II, Swing-Out Valve shall be provided for the officer's side #2 discharge.

The valve shall have an all brass body with flow optimizing, stainless steel ball, and dual polymer seats.

**OS #2 DISCH - 2-1/2" STRAIGHT NST & 30-DEGREE NST**

QTY: 1

The discharge valve shall be equipped with a straight, 2 1/2" NST, adapter that shall be equipped with a 2 1/2" NST, 30-degree, chrome plated elbow.

**2-1/2" NST PRESSURE VENTED CAP - OS DISCHARGE #2**

QTY: 1

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

**SWING 1/4 TURN CONTROL FOR OS DISCHARGE #2 -SIDE M**

QTY: 1

The officer's side, #2 discharge valve shall be controlled by a 1/4 turn swing control handle located on the operator's panel.

**CLASS ONE LIQUID FILLED 2-1/2" PRESS GAUGE - OS DI**

QTY: 1

The officer's side, #2 discharge shall be equipped with a Class One, Sub-Z II, 2.5", interlube 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.

**DS REAR DISCHARGE 2-1/2"**

QTY: 1

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

**DS REAR DISCHARGE TERMINATE @ DS REAR BODY PANEL**

QTY: 1

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

**2-1/2" NST MALE THREADS ON DS REAR DISCHARGE**

QTY: 1

The discharge shall be equipped with a 30 degree droop terminating in 2-1/2" NSTM threads.

The driver side rear discharge pipe shall be furnished with 2-1/2" NSTM threads.

**DS REAR DISCHARGE, PLUMBING, 2-1/2" STAINLESS STEEL**

QTY: 1

The driver side, rear discharge shall be plumbed utilizing 2 1/2" schedule 10 stainless steel piping, 45 degree 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.

**2-1/2" AKRON #8800 SERIES - S.S. BALL, VALVE DS RE**

QTY: 1

An Akron Brass, 2 1/2" Generation II, Swing-Out Valve shall be provided for the driver's side rear discharge.

The valve shall have an all brass body with flow optimizing, stainless steel ball, and dual polymer seats.

**PUSH/PULL CONTROL FOR DS REAR DISCHARGE**

QTY: 1

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

**2-1/2" NST DS REAR DISCHARGE PRESSURE VENTED CAP**

QTY: 1

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

**2-1/2" NSTF X 1-1/2" NSTM REDUCER W/CAP - DS REAR**

QTY: 1

A 2-1/2" NSTF X 1-1/2" NSTM reducer(s) w/cap shall be provided on the drivers side rear discharge.

**CLASS ONE LIQUID FILLED 2-1/2" PRESS GAUGE - DS RE**

QTY: 1

The driver side rear discharge shall be equipped with a Class One Sub-Z II, 2.5" interlube 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.

**OS REAR DISCHARGE 2-1/2"**

QTY: 1

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

**OS REAR DISCHARGE TERMINATE @ OS REAR BODY PANEL**

QTY: 1

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

**2-1/2" NST MALE THREADS ON OS REAR DISCHARGE**

QTY: 1

The discharge shall be equipped with a 30 degree droop terminating in 2-1/2" NSTM threads.

The officer side rear discharge pipe shall be furnished with 2-1/2" NSTM threads.

**OS REAR DISCHARGE, PLUMBING, 2-1/2" STAINLESS STEE**

QTY: 1

The officer side rear discharge shall be plumbed utilizing 2 1/2" schedule 10 stainless steel piping, 45 degree 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.

**2-1/2" AKRON #8800 SERIES - S.S. BALL, VALVE OS RE**

QTY: 1

An Akron Brass 2 1/2" Generation II Swing-Out Valve shall be provided for the officer's side rear discharge.

The valve shall have an all brass body with flow optimizing stainless steel ball and dual polymer seats.

**PUSH/PULL CONTROL FOR OS REAR DISCHARGE**

QTY: 1

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

**2-1/2" NST OS REAR DISCHARGE PRESSURE VENTED CAP**

QTY: 1

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

**CLASS ONE LIQUID FILLED 2-1/2" PRESS GAUGE - OS RE**

QTY: 1

The officer side rear discharge shall be equipped with a Class One Sub-Z II, 2.5" interlube 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**

QTY: 1

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.

**DECK GUN DISCH TERMINATE @ DRIVER'S SIDE OF DUNNAG**

QTY: 1

The deck gun discharge shall be located in the dunnage area above the pump module on the driver'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.

**DECK GUN DISCHARGE TERMINATION TO MATCH DECK GUN**

QTY: 1

The deck gun discharge pipe shall terminate with a connection matching the specified deck gun model and accessories.

**3" TFT MANUAL EXTEND-A-GUN (12") PIPE**

QTY: 1

To improve the operation range of the deck gun, the discharge pipe shall be outfitted with a TFT (12") Extend-A-Gun, part # XG12VL-\*\*. The Extend-A-Gun shall be wired to the hazard light on the cab dash.

**DECK GUN DISCHARGE**

QTY: 1

Deck gun height will be limited to the critical overall apparatus height listed in the spec. To avoid excessive travel heights the monitor will be positioned as low a practical while still allowing functionality of water stream.

**DECK GUN DISCHARGE, PLUMBING, 3" STAINLESS STEEL P**

QTY: 1

The deck gun discharge shall be plumbed utilizing 3" schedule 10 stainless steel piping, 45 degree 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.

**3" AKRON #8800 SERIES - S.S. BALL, VALVE DECK GUN**

QTY: 1

An Akron Brass 3" Generation II Swing-Out Valve shall be provided for the deck gun discharge.

The valve shall have an all brass body with flow optimizing stainless steel ball and dual polymer seats.

**PUSH/PULL CONTROL FOR DECK GUN DISCHARGE**

QTY: 1

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

**CLASS ONE LIQUID FILLED 2-1/2" PRESS GAUGE - DECK**

QTY: 1

The deck gun discharge shall be equipped with a Class One Sub-Z II, 2.5" interlube 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.

**TFT MODEL #XFC-52 CROSSFIRE MANUAL DECK GUN KIT**

QTY: 1

A TFT model #XFC-52 deck gun package which shall include the Safe-Tak ground base with dual 2-1/2" inlets, the Cross Fire monitor top, one (1) set of quad stack tips, one (1) Master Stream 1000 GPM. automatic nozzle, stream straightener and a ground base compartment mounting bracket.

**PAINT DECK GUN, PIPE & FLANGE JOB COLOR**

QTY: 1

The deck gun, pipe and flange shall be painted job color Sikksens # Job Color - \_\_\_\_\_.

**#1 FRONT DISCHARGE 1-1/2"**

QTY: 1

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

**1-1/2" NST CHICKSAN SWIVEL @ TOP CNTR FRONT BUMPER**

QTY: 1

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

**#1 FRONT DISCHARGE, PLUMBING, 2" STAINLESS STEEL P**

QTY: 1

The front #1 discharge shall be plumbed utilizing 2" schedule 10 stainless steel piping, flexible hosing, 45 degree 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.

**2" AKRON #8800 SERIES - S.S. BALL, VALVE FRONT#1 D**

QTY: 1

An Akron Brass 2" Generation II Swing-Out Valve shall be provided for the front #1 discharge.

The valve shall have an all brass body with flow optimizing stainless steel ball and dual polymer seats.

**PUSH/PULL CONTROL FOR FRONT #1 DISCHARGE**

QTY: 1

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

**1-1/2" NST FRONT #1 DISCHARGE PRESSURE VENTED CAP**

QTY: 1

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

**CLASS ONE LIQUID FILLED 2-1/2" PRESS GAUGE - FRONT**

QTY: 1

The front #1 discharge shall be equipped with a Class One Sub-Z II, 2.5" interlube 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.

**CROSSLAY #1**

QTY: 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 and constructed from brushed finish, perforated aluminum material.

**CROSSLAY #1 CAPACITY**

QTY: 1

Crosslay #1 shall be designed to have a minimum total capacity of 3.5 cubic feet as required by NFPA - 1900 to accommodate a minimum of 200 feet of 1-3/4" fire hose.

**CROSSLAY #1 DESIGN**

QTY: 1

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

**1-1/2" NST CHICKSAN SWIVEL - CROSSLAY #1**

QTY: 1

The crosslay discharge shall terminate below the hosebed floor with a 1 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.

**CROSSLAY #1, PLUMBING, 2" STAINLESS STEEL PIPING**

QTY: 1

The crosslay #1 discharge shall be plumbed utilizing 2" schedule 10 stainless steel piping and/or flexible hose, 45 degree elbows and a limited number of 90 degree sweep elbows in an assembly from the pump to crosslay hose bed.

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

**2" AKRON #8800 SERIES - S.S. BALL, VALVE CROSSLAY**

QTY: 1

An Akron Brass 2" Generation II Swing-Out Valve shall be provided for the crosslay #1 discharge.

The valve shall have an all brass body with flow optimizing stainless steel ball and dual polymer seats.

**PUSH/PULL CONTROL CROSSLAY #1**

QTY: 1

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

**CLASS ONE LIQUID FILLED 2-1/2" PRESS GAUGE - CROSS**

QTY: 1

The crosslay #1 discharge shall be equipped with a Class One Sub-Z II, 2.5" interlube 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.

**CROSSLAY #2 1-3/4"**

QTY: 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 #2 CAPACITY - 200 FEET OF 1-3/4" HOSE**

QTY: 1

Crosslay #2 shall be designed to have a minimum total capacity of 3.5 cubic feet as required by NFPA - 1900 to accommodate a minimum of 200 feet of 1-3/4" fire hose.

**CROSSLAY #2 - DOUBLE STACK HOSE DESIGN**

QTY: 1

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

**1-1/2" NST CHICKSAN SWIVEL - CROSSLAY #2**

QTY: 1

The crosslay discharge shall terminate below the hose bed floor with a 1 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.

**CROSSLAY #2, PLUMBING, 2" STAINLESS STEEL PIPING**

QTY: 1

The crosslay #2 discharge shall be plumbed utilizing 2" schedule 10 stainless steel piping and/or flexible hose, 45 degree elbows and a limited number of 90 degree sweep elbows in an assembly from the pump to crosslay hose bed.

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

**2" AKRON #8800 SERIES - S.S. BALL, VALVE CROSSLAY**

QTY: 1

An Akron Brass 2" Generation II Swing-Out Valve shall be provided for the crosslay #2 discharge.

The valve shall have an all brass body with flow optimizing stainless steel ball and dual polymer seats.

**PUSH/PULL CONTROL CROSSLAY #2**

QTY: 1

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

**CLASS ONE LIQUID FILLED 2-1/2" PRESS GAUGE - CROSS**

QTY: 1

The crosslay #2 discharge shall be equipped with a Class One Sub-Z II, 2.5" interlube 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.

**DEADLAY HOSE STORAGE ABOVE PUMP**

QTY: 1

A deadlay storage area shall be provided on the top of the pump enclosure to accommodate one (1) 1.75" Metro bundle each.

The hose storage area shall have a floor of perforated aluminum material and the sides shall be lined with brushed aluminum material.

The deadlays will be double stacked, capable of storing. There will be a false floor that divides the two hose beds and will have two aluminum trays.

**LOWERED CROSSLAYS**

QTY: 1

The crosslay hose bed floor will be approximately 42" above the side running board and no more than 66" above ground level.

**VINYL END FLAPS FOR ALUMINUM TRDPLT X-LAY CO**

QTY: 1

Vinyl flaps shall be provided at each side of the transverse cross lay compartment secured to the tread plate cross lay cover by quarter turn fasteners, and equipped with a strap to each end.

**VINYL END FLAPS FOR TREAD PLATE DEADLAY COVER**

QTY: 1

Vinyl flaps shall be provided at each side of the transverse dead lay compartment secured to the tread plate dead lay cover by quarter turn fasteners, and equipped with a strap to each end.

**DEADLAY STORAGE**

QTY: 1



Deadlay storage will be higher than the crosslays to allow ladders to pass underneath. Deadlay storage will be capable of holding (2) 1.75" Metro bundles.

**END FLAP COVER RED IN COLOR**

QTY: 2

The crosslay end flap shall be red in color.

**FRONT HINGED CROSSLAY HOSE BED COVER,TRDPLT**

QTY: 1

A 3/16" tread plate cross lay cover shall be provided with a full length stainless steel hinge at the front of the cover.

**FRONT HINGED DEADLAY HOSE BED COVER,TRDPLT**

QTY: 1

A 3/16" tread plate deadlay cover shall be provided with a full length stainless steel hinge at the front of the cover.

**BOOSTER REEL #1**

QTY: 1

**BOOSTER REEL #1 DISCHARGE**

QTY: 1

A 1 1/2" booster reel discharge shall be plumbed from the pump to the booster reel.

**BOOSTER REEL #1 DISCHARGE, PLUMBING, 1" HOSE**

QTY: 1

The booster reel discharge shall be plumbed from the valve to the hose reel utilizing 1" hose. The end of the hose connected to the hose reel shall be equipped with a swivel end for ease in hose replacement.

**1-1/2" AKRON #8800 SERIES - S.S. BALL, VALVE BOOST**

QTY: 1

A 1 1/2" Akron, #8800 series, full flow, stainless steel ball valve shall be provided for the booster reel #1 discharge.

**PUSH/PULL CONTROL FOR BOOSTER REEL #1**

QTY: 1

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

**CLASS ONE LIQUID FILLED 2-1/2" PRESS GAUGE -BOOSTE**

QTY: 1

The booster reel discharge shall be equipped with a Class One Sub-Z II, 2.5" interlube 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.

**BOOSTER REEL #1 - HANNAY ALUMINUM**

QTY: 1

BOOSTER REEL #1 One(1) Hannay, aluminum, Super Booster, electric rewind booster reel shall be furnished.

The reel shall be equipped with a one(1) inch 90 full flow swivel joint and an adjustable brake for freewheeling, drag or full lock operation.

**1" NP THREADS**

QTY: 1

The reel will have 1" NP threads for booster hose.

**BOOSTER REEL #1 LOCATED ABOVE PUMP ENCLOSURE - OS**

QTY: 1

The booster reel #1 shall be mounted above the pump enclosure towards the officer side of the unit.

**HOSE REEL #1 REWIND FOOT SWITCH BOTH OS & DS PANEL**

QTY: 1

Booster reel rewind shall be controlled by foot-operated, saddle mounted push buttons mounted below the driver's and officer's side running boards.

The booster reel circuit shall be equipped with a shielded toggle switch to act as a booster reel disconnect to avoid accidental actuation of the booster reel rewind buttons.

**BOOSTER REEL #1 HOSE, 100 FEET OF 1" HOSE**

QTY: 1

The booster reel shall be equipped with 100' of 1" booster hose in (1) 100' section.

Each length shall be fitted with NST couplings.

**TWO (2) BOOSTER REEL HOSE ROLLERS - DS & OS BLANK**

QTY: 1

Two (2) horizontal hose rollers of polished stainless steel and guide spools shall be placed one (1) on each side panel.

**FOAM SYSTEM STAINLESS PIPING - 1 INCH FROM FOAM SO**

QTY: 1

All foam concentrate plumbing from the tank or auxiliary foam inlet to the foam system components shall be stainless steel and nonferrous material.

The foam system piping shall incorporate a check valve to prevent water from entering the foam tank; the discharge piping shall also include a check valve to prevent foam solution from back feeding into the discharge side of the pump.

Individual discharge piping shall be as specified for each discharge.

The complete foam system shall be tested in accordance with NFPA-1901.

**FOAMPRO 2001 CLASS "A AND/OR B" FOAM SYSTEM**

QTY: 1

A FoamPro model 2001, electronic, fully automatic, variable speed, direct injection, discharge side foam proportioning system shall be installed in the pumping system.

The system shall be capable of handling Class "A" foam concentrates and most Class "B" foam concentrates.

The foam proportioning operation shall be based on direct measurement of water flows, and remain consistent within the specified flows and pressures.

System must be capable of delivering accuracy to within 3% of calibrated settings over the advertised operation range when installed according to factory standards.

The system shall be equipped with a digital electronic control display suitable for installation on the pump panel.

Incorporated within the control display shall be a microprocessor that receives input from the system flow meter, while also monitoring foam concentrate pump output, comparing values to ensure that the operator preset proportional amount of foam concentrate is injected into the discharge side of the fire pump.

A paddlewheel-type flow meter shall be installed in the discharge or manifold system specified to be foam capable.

A Full flow check valve shall be provided to prevent foam contamination of fire pump and water tank or water contamination of foam tank.

A 12 or 24-volt electric motor drive positive displacement foam concentrate pump, rated up to 2.5 GPM (9.5 L/min) @ 150 psi with operating pressures up to 400 psi (27.6 BAR), shall be installed in a suitable, accessible location.

The system shall draw a maximum of 40 amps @ 12 VDC or 21 amps @ 24 VDC.

A pump motor electronic driver (mounted to the base of the pump) shall receive signals from the computer control display and power the 1/2 hp (0.40 Kw) electric motor directly coupled to the concentrate pump in a variable speed duty cycle to ensure that the correct proportion of concentrate preset by the pump operator is injected into the water stream.

The digital computer control display located on the pump operator's panel shall enable the pump operator to perform the following control and operation functions for the foam proportioning system:

- Provide push-button control of foam proportioning rates from 0.1% to 9.9%, in 0.1% increments
- Show current flow-per-minute of water
- Show total volume of water discharged during and after foam operations are completed
- Show total amount of foam concentrate consumed
- Simulate flow rates for manual operation
- Perform setup and diagnostic functions for the computer control microprocessor
- Flash a low concentrate warning when the foam concentrate tank(s) runs low
- Flash a no concentrate warning and shut the foam concentrate pump off, preventing damage to the pump, should the foam tank(s) empty

The digital computer control display shall interface with the options listed; provide dual foam calibration, and display separate totals for each foam concentrate used.

If two foam tanks are required and piped to the foam concentrate pump, either an electric dual tank valve or the manual dual tank valve shall be provided.

Components of the complete proportioning system shall include:

- Operator control and display
- Paddlewheel flow meter

- Pump and electric motor/motor driver
- Wiring harnesses
- Low-level tank switch (Switches)
- Electronic dual tank valve or manual dual tank valve (if more than one tank)
- Foam injection check valve
- Main waterway check valve

Accurate concentration proportioning can be achieved, based on the following water flows:

- 85 GPM water 3.0% concentration
- 260 GPM water 1.0% concentration
- 520 GPM water 0.5% concentration
- 1300 GPM water 0.2% concentration

Note: Multiple discharges plumbed to this system may affect performance if the flow rates are exceeded by any one discharge or the totality of multiple discharges at one time!

#### **INJECTION SYSTEM DISCHARGE PLUMBING**

QTY: 1

The discharge piping shall be equipped with a properly sized flow meter sensor, based on the systems capabilities.

The foam system shall be plumbed to the following discharge/s through the discharge piping or manifold system:

#### **INJECTION FOAM SYSTEM INSTALLED ON CROSSLAY #1**

QTY: 1

Crosslay #1 discharge.

#### **INJECTION FOAM SYSTEM INSTALLED ON CROSSLAY #2**

QTY: 1

Crosslay #2 discharge.

#### **FOAM SYSTEM INSTALLED ON FRONT DISCHARGE**

QTY: 1

Front discharge.

#### **INJECTION FOAM SYSTEM INSTALLED ON DS REAR DISCHAR**

QTY: 1

Driver's side rear discharge.

#### **INJECTION FOAM SYSTEM INSTALLED ON OS REAR DISCHAR**

QTY: 1

Officer's side rear discharge.

#### **INJECTION FOAM SYSTEM INSTALLED ON HOSEREEL # 1**

QTY: 1

Hose reel # 1 discharge.

#### **PUMP INSTALLATION**

QTY: 1

**SIDE MOUNT PUMP MODULE**

QTY: 1

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.

**PUMP MODULE MATERIAL**

QTY: 1

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

**SIDE MOUNT DUNNAGE AREA**

QTY: 1

A dunnage area shall be provided above the pump enclosure for equipment mounting and storage. This area shall be furnished with a removable 3/16" 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.

**RUNNING BOARD STEPS (NON-AERIALS)**

QTY: 1

The driver and officer running board steps shall be fabricated of 3/16" tread plate 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.

**SIDE MOUNT PUMP PANEL**

QTY: 1

The pump operator's control panel shall be located on the driver side of the apparatus.

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

**SIDE MOUNT PANELS - 12 GAUGE BRUSHED STAINLESS STEEL**

QTY: 1

The left side operator's panel, gauge panel, right side pump panel and right side access door shall be fabricated from 12-gauge 304L stainless steel with a #4 (150/180 grit) standard brushed finish.

**VERTICALLY HINGED GAUGE PANEL - SIDE MOUNT**

QTY: 1

A full width, vertically hinged gauge access panel shall be provided at the operator's position.

Chrome plated positive locks shall be provided along with chain holders to prevent the front of the gauge panel from coming in contact with other panels when open.

**OFFICER SIDE VERTICALLY HINGED PUMP ACCESS DOOR -**

QTY: 1

The officer's side pump panel shall be split and vertically hinged to provide complete access to the pump and plumbing on the officer's side of the pump enclosure.

The panels shall be equipped with stainless steel hinges and secured with push type locks to hold the panels closed.

The drains located on the officer's side panel shall be fastened to the lower panel, which shall be stationary.

#### **REMOVABLE ACCESS PANEL ON THE FRONT OF PUMP ENCLOS**

QTY: 1

Two (2) removable pump access panels shall be furnished at the forward area of the pump enclosure accessed from the front when the cab is tilted.  
Each access panel shall be fabricated from 1/8" tread plate.

#### **PANEL FASTENERS**

QTY: 1

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 - CABLES**

QTY: 1

All applicable discharge and suction caps, plugs and adapters shall be equipped with tether cables and secured to the vehicle.

#### **PUMP PANEL DISCH./SUCTION TRIM PLATES**

QTY: 1

A high polished 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**

QTY: 1

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

#### **PUMP PANEL TAGS FASTENED WITH MACHINE SCREWS**

QTY: 1

The pump panel identification plates shall be securely fastened to the pump panels with machine screws.

#### **PUMP OPERATOR'S PANEL LIGHT SHIELD**

QTY: 1

The pump operator's panel shall be equipped with a light shield that shall be the full available width of the control panel, and shall be positioned to cover the lights and prevent glare. (Note: On apparatus with lowered style crosslays, the light shield shall be from the back of the crosslays to the rear of the pump house).

The light shield shall be equipped with the following lights:

#### **TECNIQ 6" LED LIGHTS - LIGHT SHIELD**

QTY: 1

Four (4) TecNiq 6" long LED lights.

One (1) light under the operator's panel light shield shall be actuated when fire pump is engaged in addition to the pump engaged light.

**OS PUMP PANEL, FULL WIDTH LIGHT SHIELD/STEP**

QTY: 1

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

The light shield shall be fabricated from tread plate, which shall also serve as a step.

The step shall be a minimum of 8" deep X the width of the pump panel.

The light shield shall be equipped with the following lights:

**TECNIQ 6" LED LIGHTS - LIGHT SHIELD/STEP**

QTY: 1

Four (4) TecNiq 6" long LED lights.

The lights shall be switched with the operator panel lights.

**PUMP PRESSURE & VACUUM TEST PORTS @ PANEL**

QTY: 1

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.

**4-1/2" CLASS ONE MASTER PRESSURE AND COMPOUND GAUG**

QTY: 1

One (1) 4-1/2" diameter pressure gauge (labeled: "PRESSURE") and one (1) 4-1/2" diameter compound vacuum gauge (labeled: "INTAKE") shall be provided.

The master gauges shall be Class One Sub-Z II, interlube filled.

The gauge faces shall be white with black numerals.

**PRESSURE & COMPOUND GAUGE RANGES - SINGLE STAGE**

QTY: 1

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.

**PUMP CERTIFICATION - 750 GPM & UP**

QTY: 1

The pump shall be third party performance tested to meet the requirements of NFPA-1900. There will be no exceptions.

**WATER TANK**

QTY: 1

The water tank shall have a capacity of 500 gallons, constructed from Poly material.

**WATER TANK**

QTY: 1

Water tank capacity may be reduced due to weight restrictions.

**FILL TOWER**

QTY: 1

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 fill tower shall be blue in color indicating that it is a water-only fill tower.

The tower shall have a 1/4" thick removable polypropylene screen and a polypropylene hinged cover.

The capacity of the tank shall be engraved on the top of the fill tower lid. Inside the fill tower there shall be a combination vent/overflow pipe.

The vent overflow shall be a minimum of schedule 40 polypropylene pipe with a minimum I.D. of that is designed to run through the tank, and shall be piped to discharge water behind the rear wheels as required in NFPA 1901 so as to not interfere with rear tire traction.

### **WATER TANK**

QTY: 1

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.

### **WATER TANK**

QTY: 1

A 2" drain valve with a push/pull handle on the pump panel shall be provided.

### **INTEGRAL FOAM TANK, 20 GAL. TANK "A"**

QTY: 1

Included in the total capacity of the water tank, a 20 gallon integral foam storage area shall be built into the water tank.

The foam tank shall have a latched fill tower, properly labeled as the foam fill point.

A valved drain shall be provided.

### **WATER TANK LEVEL GAUGE**

QTY: 1

A Fire Research, model #WLA300-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 multi color 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 with a self-calibration feature that allows the LEDs 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 LEDs 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.



**WATER TANK LEVEL GAUGE**

QTY: 1

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

**FOAM TANK "A" LEVEL GAUGE**

QTY: 1

A Fire Research, model #WLA360-A00, "TANKVISION" gauge that shows the actual volume of foam 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 multi color 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 TANKVISION gauge to be used on tanks of different shapes and sizes.

**GAUGE TRANSDUCER**

QTY: 1

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

**FOAM PRO POWER FILL FOAM TANK REFILL SYSTEM**

QTY: 1

The apparatus shall be equipped with an electronic, automatic, concentrate refill system. System shall operate independently of the foam proportioner allowing simultaneous use. Refill operation shall not require apparatus or fire pump to be running. The system shall be capable of handling Class A or Class B foam concentrates, emulsifiers, gels and decontamination concentrates.

The apparatus shall be plumbed from the externally accessed intake/flush ports to the concentrate cell following manufacturer's recommendations. The external fill and flush connections to be quick-connect, cam-lock type. Internal piping to incorporate check valves to prevent back flow. Concentrate tank inlet shall be positioned to minimize agitation per manufacturers recommendations. The refill operation shall be based on direct measurement of concentrate level in tank.

System must be capable of automatically stopping when cell is full and include a manual override feature. The system shall be equipped with an electronic control suitable for installation on the pump panel. Incorporated within the control shall be a microprocessor that receives input from the system while controlling foam concentrate pump output.

An all bronze three-way valve shall be included to allow the operator to flush system after use. Valve control, intake and flush ports shall be located within corresponding panel plate. The system shall enable the operator to perform the following control/operation functions and status indicators for the refill operation: Provide push-button start/stop control of foam refill Solid green light advises operator concentrate cell is full Flashing green indicates system is running Green light off, system off Allow override of "full tank" condition Provide a means to flush the pump and intake piping ; System shall include a 12 or 24-volt electric motor driven, positive displacement concentrate pump.

Pump shall deliver minimum flow of 10 GPM (37.8 L/min) @ 20 psi with all concentrates currently utilized in fire apparatus. Pump body to be of all bronze construction and other wetted components and piping to be constructed of non-corrosive materials. The system shall draw a maximum of 38 amps @ 12 VDC or 19 amps @ 24 VDC. A pump/motor solenoid (mounted to the base of the pump) shall receive signals

from the computer control display and power the 1/2 hp (0.4 Kw) electric motor directly coupled to the concentrate pump.

The system shall receive readings when the concentrate tank is full and stop operation to prevent overflow. ; Components of the complete refill system shall include: ; Operator control and display with Weather-Pac connectors Refill/flush quick-connect cam-lock fittings and cap Check valves Pump/motor assembly and solenoid Strainer Tank level switch Three-way fill/flush valve Stainless steel pick-up wand and 6 feet of reinforced suction hose, one (1) in diameter to allow maximum flow Panel placards

#### **APPARATUS BODY GENERAL DESCRIPTION (PUMPER)**

QTY: 1

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.

Dimensions used in this specification shall be the general outer dimension taken from a typical line diagram of the apparatus. These dimensions shall not take into account items like material thickness, access panels, doors, and other installed options.

#### **BODY SUB FRAME - ALUMINUM**

QTY: 1

The body sub structure shall be an all welded configuration utilizing a combination of 4" x 2" 6061-T6 thick walled structural tubing and 6061 structural channel unless a critical height is needed then 3" x 1-1/2" will be utilized. .

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 sub structure shall be bolted to the sides of the chassis frame at four (4) points.

The two (2) forward mounting points shall utilize a spring mount to help isolate the body from chassis deflection.

This design shall provide storage capacity in each side compartment for a minimum of 500 lbs of equipment, and a minimum of 1000 lbs of equipment in the rear step compartment.

#### **100" WIDE BODY, 29"/14" DEEP SIDE COMPARTMENTS**

QTY: 1

The fire body shall be 100" wide to provide the maximum amount of usable hose bed and compartment space. The side body compartments shall be 29" deep in any full depth areas and 14" deep in any split depth areas.

#### **SWEEP-OUT COMPARTMENTS (NON-AERIALS)**

QTY: 1

Compartment floors shall be welded to the compartment walls and have a sweep out design for easy cleaning.

Compartment 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 to produce a sealing surface for the roll-up doors below the compartment floor.

The sweep out design shall also permit easy cleaning.

#### **FASTENERS**

QTY: 1

#### **FASTENERS**

All exterior fasteners shall be stainless steel screws.

NOTE: The use of aluminum pop rivets or self tapping screws as a trim fastener shall not be acceptable.

#### **COMPARTMENT LOUVERS**

QTY: 1

Ventilation between compartments to atmosphere shall be provided and located to avoid water entry into compartments.

#### **ACCESS PANELS**

QTY: 1

Removable access panels shall be provided (if applicable) to access 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.

#### **BODY MATERIAL: 3/16" ALUMINUM**

QTY: 1

All compartment panels and body side sheets shall be fabricated entirely of 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 the reinforcement plates are inserted, allowing 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 the paint being finished to ensure proper compartment sealing.

#### **64" WIDE FENDER - CUSTOM**

QTY: 1

The body fender shall be 64" long, this shall allow for the suspension and related components to be contained within the fender, preventing any intrusion into the body compartment storage area. Bodies with notches in the front and/or rear compartment for suspension components are not acceptable. There will be no exceptions.

#### **FENDER WITH STORAGE OPTIONS (CUSTOM)**

QTY: 1

**DRIVER FORWARD FENDER - TRIPLE STORAGE SLOT**

QTY: 1

A storage compartment shall be inserted into the fender to provide a storage area for three (3) customer supplied SCBA cylinders (or fire extinguishers of similar size).

The storage area shall be sized as tall and wide as possible in the fender (minimum of 14" wide x 15" tall with an angled floor by fender radius), and shall be 26" deep.

The compartment shall have a non-abrasive lined cradle storage area for each of the three (3) devices.

This storage compartment shall provide a minimum of 2.3 cubic feet of storage space.

**DRIVER REARWARD FENDER - DOUBLE STORAGE SLOT**

QTY: 1

A storage compartment shall be inserted into the fender to provide a storage area for two (2) customer supplied SCBA cylinders (or fire extinguishers of similar size).

The storage area shall be sized as tall and wide as possible in the fender (minimum of 15" wide x 7-3/4" tall), and shall be 26" deep.

The compartment shall have a non-abrasive lined cradle storage area for each of the devices.

This storage compartment shall provide a minimum of 1.6 cubic feet of storage space.

**OFFICER FORWARD FENDER - TRIPLE STORAGE SLOT**

QTY: 1

A storage compartment shall be inserted into the fender to provide a storage area for three (3) customer supplied SCBA cylinders (or fire extinguishers of similar size).

The storage area shall be sized as tall and wide as possible in the fender (minimum of 14" wide x 15" tall with an angled floor by fender radius), and shall be 26" deep.

The compartment shall have a non-abrasive lined cradle storage area for each of the three (3) devices.

This storage compartment shall provide a minimum of 2.3 cubic feet of storage space.

**OFFICER REARWARD FENDER - DOUBLE STORAGE SLOT**

QTY: 1

A storage compartment shall be inserted into the fender to provide a storage area for two (2) customer supplied SCBA cylinders (or fire extinguishers of similar size).

The compartment shall have a non-abrasive lined cradle storage area for each of the devices.

This storage compartment shall provide a minimum of 1.6 cubic feet of storage space.

**FENDER STORAGE COMPARTMENTS - PAINTED DOORS**

QTY: 1

The fender storage area(s) shall be enclosed by a hinged door fabricated from the same material as the primary body construction, and painted the primary body color.

Each door shall be tied into the compartment door ajar/do not move apparatus warning system.

Each fender storage compartment door will be equipped with 3M model #1333 rubber "D" style door seal.

There will be no exceptions.

**SHORT PUMPER BODY (ACCOMMODATES UP TO 1000 GALLON)**

QTY: 1

**SHORT - DS FULL HEIGHT/SPLIT DEPTH - 146"**

QTY: 1

One full height/split depth compartment shall be provided forward of the rear wheels. The compartment dimensions shall be 27" wide x 68" tall and will be split depth. There will be full depth in the lower 30" tall area and split depth in the upper 38" tall area.

One high sided compartment shall be provided above the rear wheels. The compartment dimensions shall be 64" wide x 35-5/8" high and split depth.

One full height/split depth compartment shall be provided behind the rear wheels. The compartment dimensions shall be 52" wide x 68" tall and will be split depth. There will be full depth in the lower 30" tall area and split depth in the upper 38" tall area.

**SHORT - OS FULL HEIGHT/SPLIT DEPTH - 146"**

QTY: 1

One full height/split depth compartment shall be provided forward of the rear wheels. The compartment dimensions shall be 27" wide x 68" tall and will be split depth. The compartment will be full depth in the lower 30" tall area and split depth in the upper 38" tall area.

One high sided compartment shall be provided above the rear wheels. The compartment dimensions shall be 64" wide x 35-5/8" high and split depth.

One full height/split depth compartment shall be provided behind the rear wheels. The compartment dimensions shall be 52" wide x 68" tall and will be split depth. The compartment will be full depth in the lower 30" tall area and split depth in the upper 38" tall area.

**REAR STEP COMPARTMENT - FULL WIDTH, STANDARD HEIGHT**

QTY: 1

An equipment storage compartment shall be provided on the rear of the body, located at the rear step area.

The rear step compartment shall be 42" wide x 40" high x 14" deep.

The rear step compartment shall provide approximately 12 cubic feet of storage space.

**REAR STEP COMPARTMENT - FULL SIDE WALLS**

QTY: 1

The rear step compartment shall have full side panels which will isolate the storage area from the side body compartments.

**ROLL-UP DOORS**

QTY: 1

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-UP DOORS, PAINTED FINISH**

QTY: 6

The roll-up doors shall be made of Amdor brand. The doors shall be painted to match the required color of the fire department.

**PAINTED ROLLUP DOORS - PAINTED CURTAIN, TOP GUTTER**

QTY: 6

The top gutter and side frames shall be painted to match the required color of the fire department.

**PROTECTION PANELS FOR ROLL-UP DOORS**

QTY: 1

A protection panels shall be provided at the top of the body exterior compartments fitted with roll-up doors.

The panels shall be installed below the roll-up area to prevent possible damage to the roll-up door by misplaced equipment.

Each protection panel shall be as offered from the door manufacturer.

**ROLLUP PROTECTION PANELS ON 6 BODY DOORS**

QTY: 1

Six (6) rollup door protection panels shall be installed.

**REAR STEP COMPARTMENT - HINGED DOOR - TREADPLATE**

QTY: 1

The rear step compartment shall be equipped with a hinged style compartment door. The door shall be a double door configuration.

The finish shall be tread plate.

**14" WIDE COFFIN COMP'TS, SPLIT DEPTH 100" BODY, DR**

QTY: 1

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 13-1/2" inside width with a 10" 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" 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.

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.

**26" WIDE COFFIN COMP'TS, FULL DEPTH 100" BODY, OFF**

QTY: 1

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 25-1/2" inside width with a 22" 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" 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.

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.

**COMPARTMENT TOPS**

QTY: 1

Compartment ceilings shall be a fully welded design as part of the body construction process.

Compartment designs that do not have a welded in ceiling shall not be acceptable.

There will be no exceptions.

**REAR BODY PANEL**

QTY: 1

The rear body panel shall extend the full width between the body side compartments.

This panel shall be full height from the rear step to the hose bed floor.

No part of the rear panel shall be attached to the booster tank.

The rear body panel material shall be tread plate as standard.

If Chevron striping is specified for the rear of the body then smooth aluminum shall be utilized.

**STAINLESS STEEL SILL PROTECTORS, HIGH SIDE COMPTS**

QTY: 1

A 90 deg angle door sill protector, fabricated from 18 gauge brushed finish stainless steel shall be installed on the bottom external edge of each high side compartment door opening to protect this area from paint chipping.

**TREAD PLATE OVERLAY, FRONT OF SIDE COMP'TS (WRAP A**

QTY: 1

The front face of the side compartments, next to the driver and officer side pump panels shall be overlaid with tread plate full height protection.

The protection panel shall cover the entire front face of the compartment and shall wrap around the corner to the door opening.

**BODY RUB RAILS, C-CHANNEL - ALUMINUM EXTRUSION**

QTY: 1

Sacrificial extruded aluminum C-Channel style, rub rails shall be mounted at the base of the body, extending outward from the body. The rub rails shall extend the full length of the main body.

**ALUMINUM WHEEL WELL LINERS**

QTY: 1

The body wheel wells shall be provided with fully removable bolt-in aluminum fender liners. The wheel well liners shall extend from the outer wheel well body panel into the truck frame. The completely washable wheel well liners shall be designed to protect the front and rear compartments and main body supports from road salts, dirt accumulation and corrosion.

**POLISHED ALUMINUM FENDERETTES, SINGLE AXLE BODIES**

QTY: 1

The rear fenders shall be equipped with easily replaceable bolt-in polished aluminum fenderettes. The fenderettes shall be equipped with a rubber gasket molding between the body panel and the fender.

**REAR MUD FLAPS**

QTY: 1

Heavy duty mud flaps shall be provided behind the rear wheels.

**RECESSED REAR STEP**

QTY: 1

The rear step shall be a total of 16" deep, 12" recessed, and 4" extended. The recessed area of the step shall be 12" deep. The step shall be recessed between the rear portion of the rear side compartments. The step shall be 60" wide in the recessed area and 100" wide in the extended area. The step shall be fabricated from 3/16" polished aluminum tread plate and be rigidly reinforced. The recessed design of the rear step shall reduce the driver side rear side compartment depth to 14" deep in the rearmost 12" wide area of the compartment. The rear edge of the step shall be designed to accommodate the rear clearance lights. The steps are recessed for protection in the step reinforcement channel. The step shall be bolted into place with a minimum 1/2" clearance gap between the step and rear body panel.

The rear body beavertail area shall be furnished with a squared off appearance to maximize the available compartment area. The squared off appearance provides additional support to the rear step structure.

The beavertail panels shall be assembled in conjunction with the rear body corner panels. This assembly shall provide a vertical mounting surface for tail lights at the rear most portion of the body. The assembly also provides additional storage space in the rear most portion of the body. The beavertails insides shall be furnished with polished aluminum tread plate overlays.

**INTERMEDIATE REAR STEP, 8"**

QTY: 1



An eight (8) inch deep, integral to body, intermediate rear step shall be provided above the rear step compartment and shall be full width of the hose bed. The step shall be overlaid with polished aluminum tread plate.

#### **BODY HAND RAIL LOCATIONS**

QTY: 1

Two (2) horizontal, handrails shall be installed on the rear, below the level of the hose bed. One on each side of the back-up camera.

Three (3) handrails shall be mounted at the pump panels as follows:

Driver Side: One will be mounted vertically and will curve up and around the top of the dunnage area. One will be mounted horizontally on top of the dunnage lip. If possible, provide a "T" stanchion on the upper vertical rail to support the horizontal rail.

Officer side: A vertical handrail will be provided at the officers side dunnage area. Exact location to be determined at the mid-point inspection.

#### **GRAB RAILS, HANSEN KNURLED STAINLESS STEEL TYPE**

QTY: 1

All hand rails shall be Hansen 1-1/4" outer diameter, knurled stainless steel, 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 rails shall be provided at the following specified locations.

Additional grab rails shall be provided adjacent to any additional steps specified to comply with NFPA 1901.

#### **TWO (2) VERTICAL RAILS ON REAR**

QTY: 1

Two (2) vertical rails shall be mounted on the rear edge of the beavertails, one (1) each side.

#### **ONE (1) HANDRAIL, BELOW HOSE BED LEVEL**

QTY: 1

One (1) horizontal, full width handrail shall be installed on the rear, below the level of the hose bed.

#### **TWO (2) 18" HORIZONTAL HANDRAILS REAR TOP OF BODY**

QTY: 1

Two (2) 18" horizontal handrails shall be provided and installed one (1) on each side at rear top of body.

#### **HANDRAIL ABOVE PUMP PANEL, EACH SIDE**

QTY: 1

Two (2) horizontal handrails shall be mounted above each pump panel, (1) each side.

#### **INNOVATIVE CONTROLS LIGHTED STEP(S), BODY FRONT, D**

QTY: 1

Innovative Controls large lighted folding step(s), with a textured chrome plate finish, shall be provided on driver side body front to provide NFPA compliant access (maximum 18" height between steps) to an upper horizontal walking surface (compartment cap, dunnage area, fabricated step, or upper body compartments).

**INNOVATIVE CONTROLS LIGHTED FOLDING STEP(S), BODY**

QTY: 1

Innovative Controls large lighted folding step(s), with a textured chrome plate finish, shall be provided on driver side body rear to provide NFPA compliant access (maximum 18" height between steps) to an upper horizontal walking surface (compartment cap, dunnage area, fabricated step, or upper body compartments).

Provide two (2) of the specified steps. The two (2) steps will be below the intermediate rear step.

No KME logos will be provided in the steps.

**INNOVATIVE CONTROLS LIGHTED STEP(S), BODY FRONT, O**

QTY: 1

Innovative Controls large lighted folding step(s), with a textured chrome plate finish, shall be provided on officer side body front to provide NFPA compliant access (maximum 18" height between steps) to an upper horizontal walking surface (compartment cap, dunnage area, fabricated step, or upper body compartments).

**INNOVATIVE CONTROLS LIGHTED FOLDING STEP(S), BODY**

QTY: 1

Innovative Controls large lighted folding step(s), with a textured chrome plate finish, shall be provided on driver side body rear to provide NFPA compliant access (maximum 18" height between steps) to an upper horizontal walking surface (compartment cap, dunnage area, fabricated step, or upper body compartments).

**NO FOLDING STEP(S), BODY REAR, OS**

QTY: 1

No folding steps shall be provided in this location.

**I-ZONE BRACKETS CPI**

QTY: 1

There shall be two Cast Products Inc folding hose hooks with a polished finish mounted to the rear sheet, one on either side of the hose bed. Customer to locate at per-construction meeting.

**FOLDING STEP LOGOS**

QTY: 1

No Logos are to be provided on the folding steps.

**PAINTED REAR TOW EYES, BELOW BODY**

QTY: 1

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. The tow eyes will extend below the body. The tow eyes shall be smooth and free from sharp edges. They will have a minimum eyelet hole of 2-1/2". The tow eyes shall be painted.

**TOW EYES WEIGHT LABELS**

QTY: 1

Load capacity labels near the tow points. The label will state "Tow Cap. 44,000lbs." One will be installed near each rear point, attached to the underside body flange.

**WINCH RECEIVER POINT - EACH SIDE OF BODY**

QTY: 1

A 2" square receiver/hitch point shall be provided beneath the rub rail toward each side of the body for a portable winch.

The receiver/hitch 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. The receiver/hitch shall have a minimum capacity of 6000 pounds.

A 12V electrical connection with a quick disconnect compatible with the portable winch shall be provided adjacent to the receiver/hitch point.

A plastic end cap shall be provided for the quick disconnect.

#### **STANDARD BED - COFFINS EACH SIDE (60")**

QTY: 1

The hose bed shall be located directly above the booster tank and be free from all sharp objects such as bolts, nuts, and so on, in avoidance of damage to a fire hose. The hose bed side walls shall be the inboard side of the body roof compartments and the rear of the body side compartments. The inner hose bed side walls shall be brushed aluminum panels, which will help prevent damage to painted surfaces when the hose is deployed. The front wall shall be flanged inward 2" with a 1" downward return, providing additional rigidity to the front wall.

#### **CUSTOMER SPECIFIED HOSEBED CAPACITY**

QTY: 1

The hose bed shall be designed with enough storage capacity to carry the following customer specified hose load:

- 600' of 4" in a flat load (700' in 100' sections 200' in 50' sections)
- (2) 100' sections of 1.75" single-wide bundles, dead-lay
- 100' of 2" single-wide bundle, dead-lay
- 600' of 2.5" in a flat load
- 200' of 2.5" single wide, flat load, connected to the passenger side rear discharge

#### **HOSEBED FLOORING - ALUMINUM SLATS**

QTY: 1

Flooring is to be constructed from extruded aluminum and have proper spaces for ventilation purposes. The flooring shall be smooth and free from sharp edges to avoid any hose damage. The hose bed floor shall be removable, providing access to the inner body framework.

#### **FOUR (4) - 1/4" ADJUSTABLE HOSEBED PARTITIONS**

QTY: 1

Four (4) fully adjustable 1/4" aluminum hose bed partitions shall be provided.

The hose bed partitions will be 20" tall.

The partition shall be easily adjustable by channels, located at the front and rear of the hose bed.

The partition shall be removable for access to the booster tank.

#### **ONE (1) - 1/4" FIXED HOSEBED PARTITION**

QTY: 1

One (1) fixed 1/4" aluminum hose bed partition shall be provided. The partition shall be located against the backboard storage compartment to isolate it from the hose bed. The partition shall be the same height as the other hose bed partitions.

**HOSEBED STORAGE COMPARTMENT**

QTY: 1

The front portion of the main hose bed shall be positioned to provide a covered storage compartment measuring 20" front to rear and 18" deep (minimum) that runs the entire width of the hose bed. There shall be two (2) aluminum hinged doors with gas shock stay arms that are integrated with the "open compartment" warning system utilizing a proxy switch.

The water tank and foam tank fill towers shall be located within this compartment. A blank off panel shall be provided in the storage area for the fill towers to keep water or foam concentrate overflow from entering the equipment area of the compartment.

**HOSEBED BLANK PANEL**

QTY: 1

A full width divider shall be installed in the hose bed located at the forward end of the Lock-N-Load cover.

This divider shall be constructed of smooth aluminum and shall be fixed.

The adjustable hose bed dividers shall be installed up to this divider with the adjustment tracking attached to the fixed divider.

**HOSE BED WALL BRUSHED OVERLAY**

QTY: 1

A full length brushed overlay shall be installed in the hose bed.

This overlay shall be constructed of brushed aluminum and shall be fixed.

**TUBING REINFORCEMENT ON PARTITION(S) - 3/4"**

QTY: 4

The top and rear edge of each of the hose bed partitions shall have a 3/4" integral tubing reinforcement welded on for additional support.

**HOSE PARTITION HANDHOLD CUTOUTS [PER QTY]**

QTY: 4

The hose bed partition(s) shall have a vertical handhold cutout at upper rear edge of the partition.

**HOSEBED COVER - LOCK-N-LOAD SLIDING COVER**

QTY: 1

The top of the hose bed shall have an NFPA compliant cover installed in order to secure the hose from unintentionally deploying from the top or rear. The cover shall be a polished, aluminum tread plate with a combination between a roller and lift-up style. The cover shall be strong enough to support 250 pounds over the entirety. The rear half of the cover shall be able to roll over the forward half of the cover on channel tracks and are sealed with ball bearing rollers. When rolled opened, the entire cover shall be capable of being lifted up on a stainless steel piano hinge installed across the front of the body. The cover shall rise no less than 60 degrees in order to load the hose. The cover shall lock when closed. When unlocked the roller portion of the cover shall be capable of rolling forward and lock into the open rolled position. The lift portion shall be assisted and supported by a locking gas shock on one side and a non locking shock on the other side. The handles shall be installed on the end of the cover to assist with rolling and lifting. All switches shall be installed on each side of the cover, so that when the cover is opened it indicates which switches shall activate the "Do Not Move Apparatus" warning inside the cab. A mechanical locking assembly shall be provided to retain the door in the open position should there be a failure of a gas shock.

**VINYL FLAPS AT REAR EDGE OF TREADPLATE COVER**

QTY: 1

Two (2) vinyl flaps at the rear of the tread plate hose bed cover. They shall be secured to the hose bed cover with quarter turn fasteners and to the rear body with bungee cords.

A 4" wide x 2" high notch will be provided on the officer side hose bed flap to match the provided reference pictures.

The retention strap on the officer side will be moved inboard of the notch to match the location shown on the provided reference pictures.

**VINYL MATERIAL COLOR - RED**

QTY: 1

The vinyl material shall be red in color.

**BACKBOARD STORAGE SLOT OFFICER'S SIDE HOSEBED**

QTY: 1

A storage slot shall be provided for one (1) backboard. The module shall be constructed from 1/8" aluminum and built to hold a backboard with the minimum dimensions of 18 inches wide x 2 inches thick and 72 inches long. The location shall be against the officer side hose bed wall as low as possible, there will be a vertically hinged latching door for retention.

**SIDE OF WATER TANK LADDER STORAGE (OFFICER SIDE)**

QTY: 1

The ground ladders shall be stored vertically next to the water tank, behind the side body compartments. They will be located on the officer side of the apparatus. The ground ladder compartment door will be constructed of smooth aluminum, finish painted job color and shall be overlaid with an 1/8" brushed aluminum panel on the interior side. The compartment door shall be hinged towards the outside of the body. The compartment door will be secured with a D-handle latched, keyed to a #1250 key. A proximity switch will be mechanically fastened and connected to the multiplex door monitor system.

For Clarification: The rear ladder storage area will be extended upward to the floor of the coffin compartment. Storage will be provided above the ladders for broom handles, street key, closet hook (4' D-handle pike pole). The ladder storage compartment shall be the same as previous units 11326-338. The storage area for broom handles shall be adequate depth to store 62" long broom handles.

**LADDER STORAGE TUNNEL, FRONT DEFLECTOR**

QTY: 1

The ladder storage area shall be provided with a black vinyl coated polyester deflector at the forward opening to deflect road debris from entering the ladder storage area.

**LADDER ACCESS DOOR SCUFF PLATE**

QTY: 1

The ladder access door shall have an aluminum diamond plate panel on the inner surface of the door.

**DUO-SAFETY 900-A 24' 2-SECTION EXTENSION LADDER**

QTY: 1

A Duo-Safety series 900-A, 24', aluminum, two (2) section extension ladder shall be provided.

**DUO-SAFETY 775-A 14' ROOF LADDER W/ FOLDING HOOKS**

QTY: 1

A Duo-Safety series 775-A, 14', aluminum, straight roof ladder with folding hooks shall be provided.

**DUO-SAFETY 585-A 10' FOLDING ATTIC LADDER (ALUM)**

QTY: 1

A Duo-Safety series 585-A, 10', folding, aluminum, attic ladder shall be provided.

**PIKE POLE TUBE(S) - PUMPERS**

QTY: 4

A pike pole tube(s) shall be provided.

Each holder shall be accessible from the rear of the apparatus.

Each pike pole holder shall be labeled to indicate the pike pole length.

**LOCATION PIKE POLE TUBE(S) - IN LADDER STORAGE COM**

QTY: 4

The pike pole tube(s) shall be mounted in the ladder storage compartment.

**8' FIRE HOOKS UNLIMITED STEEL NY HOOK PIKE POLE W/**

QTY: 1

A 8' Fire Hooks Unlimited steel handled NY hook with pry end pike pole(s) shall be provided.

**6' FIRE HOOKS UNLIMITED STEEL NY HOOK PIKE POLE W/**

QTY: 1

Two (2) 6' Fire Hooks Unlimited steel handled NY hook with pry end pike pole(s) with mounts shall be provided and installed one (1) each side on top of the body, forward of the turntable, rearward of the cab. A PAC Hook Lok 1001 tool mount will be provided on each end of each tool.

**8' NUPLA FIBERGLASS PIKE POLE W/ D-HANDLE**

QTY: 1

A 8' Nupla fiberglass pike pole with a D-handle shall be provided.

**NUPLA 6' PIKE POLE W/ D-HANDLE**

QTY: 1

Two (2) 6' Nupla fiberglass handled pike pole with D-handle shall be provided.

**1/2 DEPTH ADJUSTABLE SHELF DESCRIPTION - RESCUE**

QTY: 1

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.

Half depth adjustable shelves shall be located as indicated at each compartment description.

**1/2 DEPTH ADJUSTABLE SHELF(S) LOCATED R-1**

QTY: 2

Located in the right side compartment #1

**1/2 DEPTH ADJUSTABLE SHELF(S) LOCATED R-2**

QTY: 1

Located in the right side compartment #2

**1/2 DEPTH ADJUSTABLE SHELF(S) LOCATED R-3**

QTY: 1

Located in the right side compartment #3

**ADJUSTABLE SHELF DESCRIPTION - RESCUE**

QTY: 1

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 indicated at each compartment description.

**ADJUSTABLE SHELF(S) LOCATED L-1**

QTY: 2

Located in the left side compartment #1

**ADJUSTABLE SHELF(S) LOCATED L-2**

QTY: 1

Located in the left side compartment #2

**ADJUSTABLE SHELF(S) LOCATED L-3**

QTY: 2

Located in the left side compartment #3

**ADJUSTABLE SHELF(S) LOCATED R-3**

QTY: 1

Located in the right side compartment #3

**ADJUSTABLE SHELF(S) LOCATED REAR COMPARTMENT**

QTY: 1

Located in the rear compartment

**250#, FLOOR MOUNTED, ROLLOUT TRAY DESCRIPTION**

QTY: 1

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 as indicated at each compartment description.

**250# ROLLOUT TRAY, LOCATED REAR COMPARTMENT**

QTY: 1

Located in the rear compartment

**C-TECH TOOL CABINET**

QTY: 1

One (1) C-Tech storage cabinets shall be provided and floor mounted in the driver's side front body compartment. Heavy duty drawer system sets consist of: (1) one top shelf, side panels, ½ inch risers, heavy duty 500 lb. slides, lock out drawer, single handle latching hardware, Gray powder coated front panels and galvanized components. Each drawer includes four (4) dividers unless otherwise stated (see drawer configuration below).

4 drawer system: 22.5"H x 22"W x 22.7"D, (1) 3" drawer, (2) 5" drawers (1) 7" drawers with four dividers each drawer

Drawer assembly shall be sized to provide a 3" storage space between the assembly and the compartment side wall.

The top shelf that comes on the C-Tech cabinet will be removed and the KME full depth shelf will be installed to take its place, and will be bolted to the top of the cabinet.

**GENERAL PAINT DESCRIPTION**

QTY: 1

The apparatus body shall be painted with Sikkens paint product. The paint process shall meet or exceed current state regulations concerning paint operations. Pollution control shall include measures to protect the atmosphere, water, and soil. Contractor shall, upon demand, provide evidence that the manufacturing facility is in compliance with State EPA rules and regulations.

The exterior shall have no mounted components prior to painting to assure full coverage of metal treatments and paint to the exterior surfaces of the body. Any vertically or horizontally hinged smooth-

plate compartment doors shall be painted separately to assure proper paint coverage on body, door jambs and door edges.

Paint process shall feature Sikkens high solid LV products and be performed in the following steps:

- Corrosion Prevention - all aluminum surfaces shall be pre-treated with the Alodine 5700 conversion coating to provide superior corrosion resistance and excellent adhesion of the base coat.
- Sikkens Sealer/Primer LV - acrylic urethane sealer/primer shall be applied to guarantee excellent gloss hold-out, chip resistance and a uniform base color.
- Sikkens High Solid LVBT650 (Base coat) - a lead-free, chromate-free high solid acrylic urethane base coat shall be applied, providing excellent coverage and durability. A minimum of two (2) coats shall be applied.
- Sikkens High Solid LVBT650 (Clear coat) - high solid LV clear coat shall be applied as the final step in order to ensure full gloss and color retention and durability. A minimum of two (2) coats shall be applied.

Any location where the material is penetrated after painting, for the purpose of mounting steps, hand rails, doors, lights, or other specified components shall be treated at the point of penetration with a corrosion inhibiting pre-treatment (ECK Corrosion Control). The pre-treatment shall be applied to the aluminum sheet metal or aluminum extrusions in all locations where the aluminum has been penetrated. All hardware used in mounting steps, hand rails, doors, lights, or other specified components shall be individually treated with the corrosion inhibiting pre-treatment.

After the paint process is complete, the gloss rating of the unit shall be tested with a 20 degree gloss meter. Coating thickness shall be measured with a digital MIL gauge and the orange peel with a digital wave scan device.

#### **GENERAL PRIMER & PREP DESCRIPTION**

QTY: 1

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.

#### **GENERAL FINISH PAINT DESCRIPTION**

QTY: 1

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.

#### **FINISH PAINT & PREP**

QTY: 1

The applicable areas of the 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.



**CAB PRIMER & PREP**

QTY: 1

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 UNDERSIDE PAINT - JOB COLOR**

QTY: 1

The exposed areas under the cab shall be painted job color to match the exterior cab.

On two tone cabs, this shall match the primary color.

**CAB BUFFING & FINISH**

QTY: 1

The exposed exterior finish of the cab shall be buffed and detailed.

**CAB INTERIOR PAINT**

QTY: 1

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

**BODY BUFFING & FINISH**

QTY: 1

The visible and exposed areas of the body shall be buffed and detailed.

**INSIDE/UNDERSIDE BODY PAINT**

QTY: 1

The inside and underside of the complete body assembly shall be painted job color using a Sikkens paint system, prior to installation of the body on the chassis or torque box.

**COMPARTMENT INTERIOR FINISH**

QTY: 1

The interior of the body compartments shall be painted with Line-X material.

**COMPARTMENT INTERIOR FINISH**

QTY: 1

The Line-X coating shall be light gray in color.

**FENDER COMPARTMENT INTERIOR**

QTY: 1

The interior of the fender storage compartments (if fender compartments are specified) shall be finish painted with Black Line-X paint to provide a protective finish.

**CAB PAINT SCHEME - TBD**

QTY: 1

The cab exterior shall be finish painted with Sikkens paint system, single color, to match purchaser's furnished paint code.

**PUMP PAINTED / UNPAINTED PLUMBING**

QTY: 1

The pump shall be painted per the pump manufacturer's standard. The stainless steel plumbing will remain unpainted. The pump area interior will match the body underside finish as described elsewhere in these specifications.

**SINGLE COLOR BODY PAINT SCHEME - TBD**

QTY: 1

The body paint finish shall be Sikkens paint system in a single color to match customer furnished paint codes and requirements.

**PINT OF TOUCH-UP PAINT**

QTY: 1

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**

QTY: 1

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

**FRAME RAIL FINISH**

QTY: 1

The chassis frame rails, suspension, axles, and drivelines (with the exception of any PTO drivelines which shall be safety yellow) 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.

**SCOTCH-LITE STRIPE**

QTY: 1

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.

**WHITE SCOTCH-LITE**

QTY: 1

The Scotch-Lite shall be white in color.

**6" SCOTCH-LITE "Z" IN STRIPE**

QTY: 1

A six (6) inch simple "Z" effect shall be incorporated into the Scotch-Lite scheme on the body.

Final layout of this configuration shall be determined by the Fire Department.

**DUAL 1" SCOTCH-LITE ACCENT ON MAIN STRIPE**

QTY: 1

A 1" high Scotch-Lite material accent stripe shall be incorporated into the Scotch-Lite scheme to border the primary Scotch-Lite stripe on the top and bottom edges.

Final layout of this configuration shall be determined by the Fire Department.

**REAR CHEVRON STRIPING**

QTY: 1

REAR CHEVRON STRIPING

**50% VERTICAL SURFACE**

QTY: 1

At least 50% of the rear facing vertical surface shall be covered with alternating strips of reflective striping.

**6" 50% REAR ORALITE CHEVRON STRIPING**

QTY: 1

The striping shall be 6" Oralite reflective striping.

**RED & YELLOW ORALITE V98**

QTY: 1

The Oralite V98 reflective tape shall be #12 red and #18 yellow in color.

**MISCELLANEOUS EQUIPMENT**

QTY: 1

The following equipment shall be mounted as specified or as loose equipment provided with the completed apparatus at the time of delivery:

**ROAD SAFETY KITS**

QTY: 1

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

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

**HANDLIGHT/S**

QTY: 4

A Streamlight model 44451 orange "Fire Vulcan" C4 LED rechargeable hand light(s) and 12 volt charger shall be installed as directed by the purchaser.

Charger shall be wired to the chassis battery system.

**WHEEL CHOCKS**

QTY: 1

Two (2) ZICO #SAC-44 folding wheel chocks shall be mounted one (1) forward and one (1) rearward of the rear wheels on the driver side below the side running board compartments.

**KME WARRANTY, STARTING ON IN-SERVICE DATE**

QTY: 1

Warranty coverage by KME will begin when the customer places the unit in service. This date may not exceed 60 days from the date of delivery to the customer.

The Customer must email [kmeservice@kmeffire.com](mailto:kmeservice@kmeffire.com) within 60 days of delivery, or the warranty start date will default to the original delivery date.

**REGULATED EMISSIONS SYSTEMS FIVE (5) YEARS OR CARB**

QTY: 1

Purchaser shall receive a Regulated Emissions Systems Five (5) Years or CARB Mileage limited warranty in accordance with, and subject to, warranty certificate RFW0140. The warranty certificate is incorporated by reference into this proposal, and included with this proposal or available upon request.

**ELECTRICAL ONE (1) YEAR WARRANTY**

QTY: 1

Purchaser shall receive a Electrical One (1) Year or 18,000 Miles limited warranty in accordance with, and subject to, warranty certificate RFW0201. The warranty certificate is incorporated by reference into this proposal, and included with this proposal or available upon request.

**FRAME ASSEMBLY STRUCTURAL TWENTY (20) YEAR WTY**

QTY: 1

Purchaser shall receive a Frame Assembly Structural Twenty (20) Years or 100,000 Miles limited warranty in accordance with, and subject to, warranty certificate RFW0304. The warranty certificate is incorporated by reference into this proposal, and included with this proposal or available upon request.

**FRAME RAIL CORROSION (PAINTED) THREE (3) YEAR WTY**

QTY: 1

Purchaser shall receive a Frame Rail Corrosion (Painted) Three (3) Years or 48,000 Miles limited warranty in accordance with, and subject to, warranty certificate RFW0310. The warranty certificate is incorporated by reference into this proposal, and included with this proposal or available upon request.

**BODY STRUCTURE (ALUMINUM) FIFTEEN(15) YEAR WTY**

QTY: 1

Purchaser shall receive a Body Structure (Aluminum) Fifteen(15) Years or 100,000 Miles limited warranty in accordance with, and subject to, warranty certificate RFW0503. The warranty certificate is incorporated by reference into this proposal, and included with this proposal or available upon request.

**PAINT AND FINISH (EXTERIOR CLEAR COATED) WARRANTY**

QTY: 1

Purchaser shall receive a Paint and Finish (Exterior Clear coated) Seven (7) Years limited warranty in accordance with, and subject to, warranty certificate RFW0707. The warranty certificate is incorporated by reference into this proposal, and included with this proposal or available upon request.

**PLUMBING AND PIPING (STAINLESS STEEL) WARRANTY**

QTY: 1

Purchaser shall receive a Plumbing and Piping (Stainless Steel) Ten (10) Years or 100,000 Miles limited warranty in accordance with, and subject to, warranty certificate RFW0800. The warranty certificate is incorporated by reference into this proposal, and included with this proposal or available upon request.

**5 YEAR CUMMINS BASE WARRANTY**

QTY: 1

The proposed 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.

**5 YEAR ALLISON EVS TRANSMISSION WARRANTY**

QTY: 1

The proposed Allison transmission will be provided with a five (5) year warranty. A copy of the Allison transmission warranty will be supplied to the purchaser to define additional details of the warranty provisions.

**3 YEAR COOLING SYSTEM WARRANTY - CUSTOM**

QTY: 1

Kovatch Mobile Equipment (KME) warrants all Cooling System Equipment components used in the construction of KME Fire Apparatus against defects and workmanship provided the apparatus is used in a normal and reasonable manner. This warranty is extended only to the original user-purchaser for a period of three (3) years from the date of delivery/acceptance to the original user-purchaser, whichever occurs first.

This warranty applies to both purchased and fabricated, manufacturer supplied coolant system components and is not provided in lieu of any Vendor provided warranties. All coolant system

components provided by the engine manufacturer are covered by the engine manufacturer's warranty only.

**SHEPPARD STEERING GEAR STANDARD - WARRANTY**

QTY: 1

The proposed Sheppard steering gear will be warranted for a period of three (3) years from the first date of service or 150,000 miles (241,401 kilometers), whichever occurs first. The product will be free from defects in material and workmanship under normal use in applications approved in advance by Sheppard.

**5 YEAR MERITOR 160 SERIES TANDEM AXLE REAR**

QTY: 1

The Meritor axle/s shall be provided with a five (5) year warranty. The first two (2) years shall be parts and labor; the remaining three (3) years shall be parts only. Wheel seals, gaskets and wheel bearings shall be covered for one year. A copy of Meritor's warranty shall be supplied to define additional details of the warranty provisions. Vehicles that operate full or part-time outside the United States and Canada shall have a one (1) year, parts only warranty.

**5 YEAR LETTERING WARRANTY**

QTY: 1

The apparatus manufacturer will provide a five (5) year warranty against defects in material and workmanship for all graphics processes. Any valid claims must be made in writing within 15 days of the determination of any defects to the manufacturer's fire apparatus. The manufacturer will at its option make any necessary repairs either at a local authorized service center or at the factory if required. The manufacturer will make the final decision as to where the repairs are to be made and any transportation cost is the owner's responsibility. The manufacturer will at its option, repair or replace any verified defects in workmanship or materials at no cost to the owner provided all the requirements of this warranty have been met.

The manufacturer will not be liable to the original purchaser or anyone else for consequential, incidental, special or direct damages, including, but not limited to, any claims for loss of profits, downtime, loss of use or inconvenience. THE COMPANY MAKES NO OTHER WARRANTY, EXPRESSED OR IMPLIED, AND SPECIFICALLY, DISCLAIMS ANY IMPLIED WARRANTY INCLUDING THE WARRANTY OF MERCHANTABILITY.

The manufacturer continually strives to improve its products and therefore, reserves the right to make improvements or changes without incurring any obligations to make such changes or additions to equipment previously sold.

**1 YEAR BRIGHTWORK WARRANTY**

QTY: 1

KME Fire Apparatus (KME) warrants all bright finish components used in the construction of KME Fire Apparatus against defects and workmanship provided the apparatus is used in a normal and reasonable manner. This warranty is extended only to the original user-purchaser for a period of one (1) year from the date of delivery/acceptance to the original user-purchaser, whichever occurs first.

The expressed warranty excludes corrosion or degradation of bright finished components caused by damage to the component.

**FRONT SUSPENSION - STEERTEK - 5 YEAR WARRANTY**

QTY: 1

The Hendrickson Steertek NXT front axle shall be provided with a five (5) year parts and labor warranty and shall include the axle and kingpin assembly, the steering arm assembly, and the upper and lower steering knuckle assembly.

The warranty for the integrated suspension components shall be two (2) years or two hundred fifty thousand (250,000) miles, whichever occurs first.

The integrated suspension components covered under this two year warranty are limited to:

- Front Frame Hanger Assemblies
- Rear Shackle Assemblies
- Jounce Stop Assemblies
- Rear Frame Hanger Assemblies
- Shock Absorbers
- Shock Absorber Brackets
- Leaf Spring Assemblies

A copy of the Hendrickson Steertek NXT Warranty shall be provided to define additional details of the warranty provisions.

**HENDRICKSON AIR RIDE - SGL AXLE -THREE YEAR**

QTY: 1

Hendrickson warrants suspension products manufactured by it to be free from defects in material and workmanship which occur under normal use and service for a period of three(3) years (base year + 2 years).

This warranty will not apply and no warranty of any kind will exist as to any product which has been subject to abuse, misuse, neglect, misapplication or accident of any type or cause or which has been repaired, replaced, substituted or used with parts other than genuine Hendrickson parts or altered by anyone.

**LIFETIME POLY TANK WARRANTY - ALL TANKS**

QTY: 1

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.

**HALE FIRE PUMP WARRANTY FULL 5 YEAR LABOR**

QTY: 1

Hale Products, Incorporated ("Hale") hereby warrants to the original buyer that products manufactured by Hale shall be 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, Hale will cover parts and labor for the entire warranty period.

**FOAM PRO 2000 SERIES STANDARD WARRANTY**

QTY: 1

The liability of FoamPro under the foregoing warranty will be limited to the repair or replacement at FoamPro's option without charge for labor or materials of any parts upon return of the entire pump, system or other product or of the particular part to the FoamPro factory within the warranty period, at the sole expense of the purchaser, which part will upon examination appear to FoamPro's satisfaction to have been defective in material and workmanship.

**AKRON - 5 YEAR LIMITED WARRANTY**

QTY: 1

The limited warranty set forth here against defective materials or workmanship for a period of five (5) years will be given by Akron Brass Co. with respect to Akron Brass Co. products purchased and used in the United States and Canada respectively. All Akron valves are warranted for 10 years.

**CLASS 1 - ELECTRICAL PRODUCT WARRANTY**

QTY: 1

Class 1 warrants that any equipment of our own manufacture (or manufactured for us pursuant to our specifications) found to have defects in material or workmanship during normal use and service, will be repaired or replaced (at our option) free of charge, provided that written notice of such defect is received by us within two years (three for liquid-filled gauges) after initial shipment.

All equipment requiring repair or replacement under this warranty will be returned prepaid to Class 1. Such returned equipment will be examined by us and, if found to be defective as a result of materials failure or workmanship, will be repaired or replaced at no charge.

**VALOR SEATING 6 YEAR WARRANTY**

QTY: 1

Valor will warrant each new seat manufactured, to be free from defects in materials and workmanship when delivered to the original purchaser for a period of six (6) years.

Labor to remove or reinstall defective items will not be covered under this warranty. All warranty claims shall have prior approval from Valor warranty department.

**CORROSION TREATMENT**

QTY: 1

Upon apparatus completion, underside of the apparatus, from the pump enclosure-back, shall have anti corrosion film applied to help inhibit rust and the corrosion process. The semi-firm wax film shall be applied by air spray method. The film shall be applied as a minimum to the following areas: body substructure, underside of all body compartments, running board supports and rear step supports. No film shall be applied directly to the exhaust system or wheel wells.

NOTE: The film shall remain semi-firm to promote self-sealing. The film may leave a light tinted color to those areas treated.

**ADDITIONAL ITEMS SHIPPED WITH VEHICLE**

QTY: 1

- 1 - Bag of assorted stainless steel nuts and bolts

**VEHICLE CLASS TIER 0**

QTY: 1