TOWN OF MONTVILLE

LEGAL NOTICE AND INVITATION TO BID

BID #2021-2

The Town of Montville is soliciting sealed proposals for furnishing a Pumper for the Mohegan Fire Department.

Please see the Town's website at <u>www.montville-ct.org</u>. for bid specifications and particular terms and conditions.

All proposals must be sealed and must be received at the Finance Dept, Town Hall, 310 Norwich-New London Tpke, Uncasville, CT 06382 prior to the due date. All bids are due no later than January 7, 2021 at 10:00 a.m. The bids will be opened publically and read aloud at the Town Hall Town Council Chambers. All bids must be in a sealed envelope marked "**Mohegan Fire Department Pumper.**" All bids must be signed by company official.

The Town of Montville reserves the right to reject any or all bids and waive any informalities or irregularities in the bid procedure or bids.

Theresa Hart Director of Finance

Bid Disclosure

In addition to other reservations and conditions contained in the proposal documents, the Town of Montville reserves the right to waive any technical defects in the proposals received; to waive any formalities or irregularities; to reject any and all proposals for any reason, including that it or they do not conform to the terms and conditions described herein, as determined by the Town in its sole discretion; to accept or reject any part of any proposal received; to present and negotiate terms of a contract together or separately with any party submitting a proposal; to determine qualifications exclusively and finally; to request additional qualifications; and to select any proposal or part thereof based on any combination of factors, including the amount proposal, the time of completion, and the Town's best interests. The Town further reserves the right to retain all proposals submitted and to use any ideas in a proposal regardless of whether or not that proposal is selected.

The Town may hold the bids for a period not to exceed sixty (60) days from the date of the bid opening to review the bids and investigate the bidders' qualifications prior to awarding the contract.

All bidders are advised the Town of Montville has enacted through resolutions the following special conditions concerning Town bids and purchases.

- 1. For all Town purchases of goods and services not utilizing State or Federal funds, any Town bidder that has submitted a bid not more than 15% (fifteen percent) higher than the low bid may be awarded the project provided such Town based bidder agrees to accept the award of the bid at the amount of the low bid. If more than one Town based bidder has submitted bids not more than 15% (fifteen percent) higher than the low bid, and have agreed to accept the award of the low bid, the lowest responsible bidder shall be the one of such Town based bidders that submitted the lowest bid. That within the bidding process that all businesses claiming to be Montville businesses, provide the Finance Department (Assessor's Section) with sufficient documentation to prove that they are in compliance with property tax assessments, including motor vehicle tax assessments.
- 2. Seller agrees that as a condition of his sale of goods and/or services to the Town of Montville, the Town of Montville will be authorized to deduct from the proceeds due Seller an amount not to exceed 25% of the total amount due Seller. Said amount is to be applied against any unpaid and overdue taxes, assessments, fees, or other charges levied by the town of Montville or any agency thereof against the Seller. The Seller further agrees that Seller shall insure that Seller has the right to withhold an amount not to exceed 25% from each subcontractor working for the Seller, and providing goods and/or services to the Town of Montville, and to remit such withheld money to the Town in full or partial satisfaction of any unpaid and overdue taxes, assessments, fees, or other charges levied by the Town of Montville or any agency thereof against such subcontractor.

Town of Montville Bid Specification

DESIGN CLAUSE

These specifications outline the components, installation methods, and operational characteristics the manufacturer is agreeing to provide in order to meet the Town of Montville'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 Town of Montville desires a different construction or installation not already described in these specifications, additional charges may apply, and quoted lead time commitments will be adjusted.

COMPLETION INFORMATION

The manufacturer will 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).

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

Written load analysis and results of electrical performance tests.

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

FMVSS REQUIREMENT

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

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

RECORDS

The contractor will be responsible for preparing and maintaining a record file of parts and assemblies used to manufacture the apparatus.

These records will be maintained in the factory of the manufacturer for a minimum of twenty (20) years.

File will contain copies of any and all reported deficiencies, all replacement parts required to maintain the apparatus, and original purchase documents including specifications, contract, invoices, incomplete chassis certificates, quality control reports and final delivery acceptance documents.

Mohegan Fire Company will have access to any and all documents contained in this file upon official written request.

TOP OF THE LINE CHASSIS - MULTIPLEX

The manufacturer will propose a custom built chassis, which is "Top of the Line" and includes an integrated multiplexed electrical system.

GENERAL CONSTRUCTION

The complete apparatus, assemblies, subassemblies, component parts, etc., will be designed and constructed with the due consideration to the nature and distribution of the load to be sustained and to the general character of the service to which the apparatus is to be subject.

All parts of the apparatus will be designed with a factor of safety, which is equal to or greater than that which is considered standard and acceptable for this class of equipment in firefighting service.

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

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

The contractor'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 will 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 will be carried without overloading or injuring the apparatus.

SINGLE LINE RESPONSIBILITY

The apparatus shall be constructed by true "sole source" manufacturer.

The manufacturer shall engineer, design, manufacture, build and paint their own fire apparatus cab, chassis, body, and electrical systems.

All work shall be done in the manufacturer's owned and operated manufacturing facilities by direct employees of the manufacturer.

This capability provides consistent design and manufacturing procedures that will reduce warranty issues and provide ease in parts replacement.

PRODUCT LIABILITY

The manufacturer will supply proof of product liability and facility insurance equal to or exceeding \$30,000,000.00.

This will be provided as part of the proposal.

PAINT CERTIFICATION

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

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

SERVICE STATEMENT

The vehicle must be offered with service for in or out of warranty repairs which can be promptly performed by the authorized service center. The authorized service center must be located within a distance of 10 miles from Mohegan Fire Company.

SERVICE CENTER CAPABILITIES

The Service Center must be a Hale Master Parts and Service Center that operates three (3) on the road service trucks that can offer In Station Service repairs to your apparatus if needed.

The service center must offer twenty-four (24) hour service in which assigned service personnel carry pagers; one (1) man is always on call to handle any truck that is down and out of service.

The service facility must provide service to handle sheet metal repair and fabrication, pump and electrical repair, aerial ladder service, and repair booster tank enlarging and replacement, and minor or major refurbishment capabilities.

The service center employees must be fully insured with 1 Million Workman's Compensation, 1 Million Dollar Garage Keepers Liability Insurance Coverage and a 25 Million Dollar Products Liability Insurance Policy to protect your fire company in case of injury to personnel or your fire company equipment.

PRICES & PAYMENTS

The proposal price will be F.O.B. Destination, on a delivered and accepted basis at Mohegan Fire Company.

Total price on the contractor's bid proposal sheet will include all items listed in these specifications.

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

PROPRIETARY PARTS

It is the intention of the Town of Montville for all bidders to furnish the apparatus with major parts commonly used by the heavy-duty truck manufacturers and open market vendors whereas replacement parts are more readily available and at reduced cost. The use of proprietary parts such as but not limited to axles, suspensions, engines, transmissions, frontal air bags, electronic controls, multiplexing systems, seats, pumps, gauges, foam systems, etc., may not be acceptable by the Town of Montville.

FAIR ETHICAL & LEGAL COMPETITION

In order to ensure fair, ethical, and legal competition, neither original equipment manufacturer (OEM) nor parent company of the OEM will have ever been fined or convicted of price fixing, bid rigging, or collusion in any domestic or international fire apparatus market.

MATERIAL & WORKMANSHIP

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

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

CONTRACT ADMINISTRATOR

The manufacturer will designate a contract administrator to provide a single point interface between Mohegan Fire Company and the contractor on all matters concerning the contract.

APPROVAL DRAWING

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

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

DELIVERY

Delivery of the apparatus to Mohegan Fire Company will remain the responsibility of the contractor.

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

INSTRUCTION MANUALS

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, will be provided at time of delivery of each vehicle.

The manufacturer will 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 will contain the following:

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

VEHICLE FLUID PLATE

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

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

- Engine oil
- Engine coolant
- Chassis transmission fluid
- Pump transmission lubrication fluid
- Pump primer fluid
- Drive axle 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

UNIT BUILT AT HEADQUARTERS

In order to ensure top quality construction, maximum assembly line and engineering communication and the highest level of manufacturing supervision the entire apparatus will be built at the manufacturer's primary (headquarters) manufacturing facility.

Apparatus constructed at satellite plants will not be considered.

EXACT BLUEPRINT WITH BID

A scale drawing of the specific apparatus being proposed will be submitted with the bid proposal.

Drawings of similar units or demo units will not be permitted.

The manufacturer will be clear that this provision is requiring a scale drawing of the truck which is actually being proposed.

The drawing will be done at the manufacturer's facility by the manufacturer's engineering department in order to guarantee the accuracy of the drawing.

Failure to comply with this requirement will be grounds for rejection of the proposal.

FAMA MEMBERSHIP

The manufacturer shall be a current member of the Fire Apparatus Manufacturer's Association (FAMA).

MANUFACTURED IN UNITED STATES

The entire apparatus will 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.

ISO REQUIREMENT

The manufacturer will operate a Quality Management System that is certified to ISO 9001 by an organization that is accredited by the ANSI-ASQ National Accreditation Board (ANAB).

This type of business management system will allow the manufacturer to monitor processes to ensure they are effective; keep adequate records; check output for defects, with appropriate and corrective action where necessary; regularly review individual processes and the quality system itself for effectiveness; and facilitate continual improvement. A copy of the registration certificate must be included in the proposal.

AMP DRAW REPORT

The manufacturer will provide with their 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 will include the following:

- The rating of the alternator.
- The minimum continuous load of each component that is specified per: Applicable NFPA-1901.
- Additional loads that, when added to the minimum continuous load, determine the total connected load.
- Each individual intermittent load.

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

TURNING RADIUS REPORT REQUIRED

The proposal will include a drawing of 11" x 17" showing the apparatus turning radius, wheel/tires and front bumper sweep radius with the specified front extension.

COOPERATIVE PURCHASING

The manufacturer will be pleased to allow other public agencies to use the purchase agreement resulting from this invitation to bid unless the contractor expressly notes on the proposal form that prices are not available for tag-on.

The condition of such use by other agencies will be that any such agency must make and pursue contact, purchase order/contract, and all contractual remedies with the contractor.

Such tag-ons will be done so that Mohegan Fire Company has no responsibility for performance by either the manufacturer or the agency using the contract.

VEHICLE DATA PLATE DESCRIPTION

The following safety signs will be provided in the cab:

- A label displaying the maximum number of personnel the vehicle is designed to carry will be visible to the driver.
- "Occupants will be seated and belted when apparatus is in motion" signs will be visible from each seat.
- "Do Not Move Apparatus When Light Is On" sign adjacent to the warning light indicating a hazard if the apparatus is moved (as described in subsequent section).

- A label displaying the height, length, and GVWR of the vehicle will be visible to driver.
- This label will indicate that the fire department will revise the dimension if vehicle height changes while vehicle is in service.

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

Fluid Data

- Engine Oil
- Engine Coolant
- Chassis Transmission Fluid
- Pump Transmission Lubrication Fluid
- Pump Primer Fluid (if applicable)
- Drive Axle Lubrication Fluid
- Air Conditioning Refrigerant
- Air Conditioning Lubrication Oil
- Power Steering Fluid
- Cab Tilt Mechanism Fluid
- Transfer Case Fluid (if applicable)
- Equipment Rack Fluid (if applicable)
- Air Compressor System Lubricant
- Front Tire Cold Pressure
- Rear Tire Cold Pressure
- Maximum Tire Speed Rating

Chassis Data

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

Manufacturers weight certification:

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

VEHICLE TRANSPORTATION

Transportation for the completed vehicle from the manufacturer's facility to Mohegan Fire Company will be provided by the manufacturer.

GENERAL INFORMATION - NFPA 1901

The proposed apparatus will be constructed to withstand the severe and continuous use encountered during emergency firefighting 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, fire pump and related components, water tank, 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. 1901, latest edition, except as noted in the Statement-of-Exceptions.

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

NFPA TREADPLATE CERTIFICATION

All stepping, standing, and walking surfaces on the body will meet NFPA #1901 anti-slip standards.

Aluminum tread plate utilized for stepping, standing, and walking surfaces will be Alcoa No-Slip type.

This material will be a minimum 3/16 (0.1875") in thickness.

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

All vertical surfaces on the entire vehicle will also have NFPA treadplate in order to provide a consistent pattern.

"PUMPER FIRE APPARATUS" NFPA 2016 CHAPTERS

The unit will be designed to conform fully to the "Pumper Fire Apparatus" requirements as stated in the NFPA 1901 Standard (2016 Revision), which will 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 16'' FIRE PUMP REQUIREMENTS

Chapter 16 Fire Pump and Associated Equipment

SAFETY SIGNS (NFPA REQUIRED)

Safety signs will be located on the vehicle at the rear step, and at any cross walkways, to warn personnel that riding in or on these areas while the vehicle is in motion is prohibited.

THIRD PARTY TESTING

If required by the specific chapters of NFPA-1901, the proposed unit will be tested and certified by independent third party inspectors.

All test work for fire pumps outlined in NFPA 1901, Edition will be conducted.

The third party inspectors will 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 persons performing the inspection will present for review proof of Level II Certification in the required NDT methods.

The manufacturer will 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 will be reviewed by the Supervisor of Fire Equipment Services and a Registered Professional Engineer.

When the unit successfully meets all the requirements outlined in NFPA 1901, current edition, the third party inspector will issue a Certificate of Automotive Fire Apparatus Examination and Test stating the unit's compliance with NFPA- 1901.

CUSTOM CAB

The cab will be a custom tilt style, built specifically for fire service.

The cab will be a cab over engine design, with integral tilt mechanism and engine access from inside the cab.

Cab will be designed, fabricated, assembled in its entirety, and installed on the frame rails in the manufacturer's factory.

This requirement will eliminate any split responsibility in warranty and service.

The cab interior will 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

The cab will 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 will be a welded assembly, fabricated of 6063 structural aluminum alloy. This frame will 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 will be of entirely welded construction.

The front cab wall will be of double wall type construction, featuring an inner and outer panel.

CRASH TESTING

To ensure the safety of the cab occupants and cab integrity, proof of third party testing will be provided.

The cab will be certified for SAEJ2422 side impact, SAEJ2420 with ECER29 cab front impact, and ECER29 cab roof strength.

Furthermore, proof of testing and certification will 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 will be performed with no support immediately behind the cab, thus providing an authentic test result.

120,000# ROOF & SIDE TESTING

The cab design will include additional third party testing to ensure the safety of the cab occupants and cab integrity, proof of third party testing will be provided.

The cab will be certified for SAEJ2422 side impact, SAEJ2420 with ECER29 cab front impact, and ECER29 cab roof strength.

The manufacturer will provide proof that third party testing has been conducted to prove a static roof and a static side-load test has been completed. In these tests, a 120,000 pound static load was first applied to the roof.

This test was followed by applying the same 120,000 pound static load to the side of the cab.

These tests will be conducted per the SAE J2422, Cab Roof Strength Evaluation, protocol and the ECE R29,

Uniform provisions concerning the approval of vehicles with regard to the protection of occupants of the cab of a commercial vehicle, protocol.

During both tests, the cab will withstand these loads without encroachment into the occupant survivable space and all doors remained closed during the test.

The tests will be documented with photographs and real-time video in a report provided to the manufacturer.

74"

CAB LENGTH

Minimum Cab Dimensions:

• Overall width

- 100" (Inside width across ceiling 92") 62-1/2"
- Centerline front axle to back of cabCenterline axle to front of cab

CAB ROOF

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

ALUMINUM TREAD PLATE OVERLAY ON CAB ROOF

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

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

CAB ROOF DRIP RAIL

For enhanced protection from inclement weather, an integral drip rail will be furnished on each side of the cab roof. The drip rail will extend the full length of the cab roof.

BATTERY ACCESS DOOR

The battery access door will be 1/8" aluminum tread plate, drop down door with thumb latches at the rear drivers side cab step well.

CAST ANTI-SLIP ENTRY STEPS

Each of the forward entrance steps will be a minimum of 8-1/2" deep with the floorboard recessed a minimum of 5" to avoid "shin knocking".

Each step will be a bolt-in cast aluminum step. Each of the rear entrance steps will be a minimum of 8-1/2" deep.

An intermediate step will be provided between the lower entrance step and the crew area floor for ease of entry and egress.

Each step will be fabricated as an integral part of the cab construction. The cab step risers will be painted to match the cab exterior color. Each lower step; will be a bolt-in cast aluminum step.

REAR CAB FOLD DOWN STEPS

A large, chrome-plated folding step to match the rest of the body steps will be provided on the driver and officer's side rear outer exterior edges of the cab.

These steps will allow access to the transverse hose beds or pump dunnage area. These steps will be illuminated by the pump area lighting.

CAB DOORSTEP TRIM

Cast aluminum wheelabrated cab step trim will be included in the area of the cab where the floor meets the step transition area.

CAB DOORS

Four (4) side-opening doors will be provided. The cab doors will be totally constructed of aluminum with an extruded aluminum frame and an aluminum outer door skin. Doors will be full height from the step to the cab roof extrusion and enclose the step area when the doors are closed.

There will be a heavy duty, piano type, stainless steel hinge on each door with a minimum pin diameter of 3/8". Hinges will be slotted for ease of horizontal and vertical adjustment. There will be a cab door seal and the doors will close flush with the side of the cab. A heavy duty 6" wide belting material will be utilized to prevent the cab doors from opening greater than 90 degrees.

DOOR LATCHES

A semi-recessed chrome plated pull handle, capable of operating with a gloved hand, will be provided on the exterior of each cab door.

Heavy-duty, bright finish cast paddle latches will be provided on the interior of each cab door.

Door latch mechanisms which utilize spring steel clamps will 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.

DOOR LOCKS

Each exterior cab door will be equipped with keyed locks. The cab doors will be capable of being locked from the outside with a key and from the inside with a control in each interior paddle latch.

KEY MODEL #2001

The specified door lock cylinder/s will be equipped with #2001 key/s.

ELECTRIC WINDOWS

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

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

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

DOOR WINDOW TRIM EXTRUSION

Each side cab door window will be designed with a custom extruded trim plate, which will conform to the perimeter of the window opening in each door.

The trim plate will extend from the edge of the door skin to the window and will have a silver anodized finish.

DOOR PANELS

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

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

SCOTCHLITE INTERIOR OF DOOR PANELS

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

WINDSHIELD

A two piece, symmetrical, safety glass windshield will be provided on the cab for the driver and officer providing a clear viewing area.

The windshields will 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 will 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 will consist of three (3) layers; the outer light, the middle safety laminate and the inner light.

The thick outer light layer will provide superior chip resistance, the middle safety laminate layer will prevent the windshield glass pieces from detaching in the event of breakage and the inner light will 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 will 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 will not be acceptable.

WINDSHIELD WIPERS & WASHERS

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

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

Wipers will have "HI/LO" and "INTERMITTENT" operating speeds. "HI/LO" speeds will be controlled by a steering column control, within the turn signal control stem.

"INTERMITTENT" operation will be controlled by a twist switch within the control on the steering column.

The wipers will be of the self-parking type.

Windshield washers will 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 will be visible through a cutout in the access door. This door will be secured with two thumb latches.

The washer control will be integral with the intermittent wiper control switch.

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

Windshield wipers will 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 manufacturer will certify that the wiper system design has been "Third party tested" and that the wiper system has met this criteria.

DARK TINT WINDOWS

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

EXTERIOR CAB GRAB RAILS

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

There will be one (1) at each cab door entrance.

Each grab rail will have white LED lights that will be wired to the DOT marker lights and interlocked to illuminate when the parking brake is applied.

Grab rail stanchions will be chrome plated and offset when necessary to prevent "hand-pinching" when opening or closing the doors.

Formed rubber gaskets will be provided between each stanchion base and the cab surface.

INTERIOR GRAB HANDLES

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

- One (1) 11" long, horizontally mounted on each front cab door on the upper interior door panel
- One (1) 12" long, vertically mounted on the officer's side "A" post
- One (1) 11" long, horizontally mounted on each rear cab door on the interior door panel
- One (1) 30" long, horizontally mounted on each rear cab door, located approximately 8" above the bottom of the window opening

FRONT CAB GRILLE

A shaped mirror finished stainless steel grille will 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 manufacturer's emblem.

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

FRONT CAB GRILLE SCREEN

A mesh bug screen will be provided behind the front grill assembly to protect the radiator from bugs and other debris.

The screen will be secured to the front of the cab by button snaps, behind the main grill.

SIDE CAB GRILLES

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

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

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

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

CAB EXTERIOR REAR WALL

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

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

CAB WHEEL WELL LINERS

The front cab, wheel wells will be equipped with fully removable bolt-in aluminum inner wheel well liners.

The liners will extend full depth into the truck frame.

The completely washable wheel well liners will 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

The cab wheel well openings will be trimmed with replaceable, bolt-in, polished aluminum fenderettes.

The fenderettes will 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 will be used where the cab and fender meet.

FRONT MUD FLAPS

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

CAB MIRRORS

Two (2) Velvac West Coast style 2010 mirrors will be furnished, one 708211-4 and one 708212-4 on each front cab door.

Each mirror will have a 16 x 8 flat glass head, mounted in a polished, 300 series stainless steel outer shell and a heavy duty, ABS inner housing.

Each head will be electrically heated and motorized with controls on the driver's lower wing panel.

Each mirror will be installed on a one piece, stainless steel loop.

The mirrors will be mounted to the forward portion of the door with two (2) brackets, forward of the windows.

Two (2) 6 diameter, stainless steel, convex mirrors will also be furnished with one on each lower loop of the mounting bracket.

MIRROR CONTROL

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

100" - DIMENSIONS FRONT SEATING & ENGINE ENCLOSURE

•	Top of front seat to ceiling	44" (depending upon seat type)	
•	Seat back to steering wheel	22" (depending upon seat type)	
•	Inside width (door to engine enclosure)	27" (driver's side, at floor)	
•	Inside width (door to engine enclosure)	24" (officer's side, at floor)	
•	Floor to top of engine enclosure	27"	
•	Front cab floor to top of center dash	34-3/4"	
Glass Area Dimensions:			
•	Windshield (Contour)	3,422 sq. in.	
•	Front door window, retractable	743 sq. in. each	
•	Rear door window, retractable	875 sq. in. each	
•	Fixed side windows	620 sq. in. each	

INTERIOR TRIM

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

All interior upholstery panels will be gray in color.

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

INTERIOR REAR WALL

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

CAB FLOORING

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

ACOUSTICAL INSULATION

One (1) inch thick acoustical insulation will be provided on the cab roof, rear and side walls of the cab.

This material will be fitted between the cab structural members and secured with adhesive to provide an insulation barrier for noise and heat.

ENGINE ENCLOSURE

The forward portion of the engine enclosure will be covered with a Durawear 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 will feature a contour shape. The engine enclosure will not significantly obstruct the driver's vision in any direction.

The enclosure will be an integral part of the cab structure, which will be constructed from material providing adequate strength to support radio, map boxes, etc. The engine enclosure will be insulated to protect from heat and sound. The noise insulation will keep the DBA level within the limits stated in the current NFPA series 1901 pamphlet.

ENGINE ENCLOSURE ACCESS

A composite, hinged access door will be provided in the top rearward portion of the engine enclosure. The door will allow access to the engine oil, transmission fluid, power steering fluid level dipsticks. The access door will be provided with a flush mounted latch. The underside of the access door will be insulated.

SOUNDPROOFING / INSULATION UNDER ENGINE

The underside of the engine enclosure will be overlaid with Milcut, MilShield insulation. MilShield can withstand temperatures up to 1300°F. To ensure a clean, smooth surface, this material will have a heavy aluminum foil covering. Any gaps in this insulation barrier will be sealed with 3M #425 aluminized high temperature tape.

SUN VISORS

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

SEAT AND SEAT BELT ANCHOR TESTING

Each seat belt anchor will 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 will be tested to withstand 20G's of force in accordance with FMVSS 207 section 4.2(c).

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

STORAGE COMPARTMENTS UNDER FRONT SEATS

There will be a compartment provided under each front seat. Each compartment will be accessible from the side of the seat riser when the door is opened.

DRIVER SEAT

The driver's seat will be a H. O. Bostrom Sierra Air-50RX/HD/ABTS LH air suspension, high back bucket with low profile, seat cushion.

The seat will have a tapered and padded back cushion with lumbar support.

The seat will have a five inch, before and after adjustment, a three inch height adjustment with a reclining seat back.

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

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

The driver's seat will be equipped with an H. O. Bostrom Heavy Duty air ride suspension.

OFFICER SEAT

The officer's seat will be a H. O. Bostrom Tanker 450 ABTS RH series fixed base SCBA seat.

The seat will have a tapered and padded seat cushion with lumbar support. The seat will include a SCBA storage area with integral headrest.

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

SCBA BRACKET

The officer's seat will include a H.O. BOSTROM Secure All SCBA Locking System.

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

The center guide fork will keep the tank in-place for a safe and comfortable fit in seat cavity.

Fire fighters will simply push the SCBA unit against the pivot arm to engage the patented, auto-locking system.

Once the lock is engaged, the top clamp will surround the top of the SCBA tank for a secure fit in all directions.

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

OFFICER SIDE OUTBOARD REAR FACING SEAT

The officer's side, outboard, rear facing, crew seat will be a H.O. Bostrom Tanker 450 ABTS LH series, fixed base SCBA seat.

The seat will have a tapered and padded seat cushion with lumbar support. The seat will include a SCBA storage area with integral headrest.

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

SCBA BRACKET

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

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

BOSTROM SEATING MATERIAL

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

SEAT ADJUSTMENT NOTICE

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

VEHICLE DATA RECORDER

A Class 1 Vehicle Data Recorder (VDR) system will be provided.

The system will include an NFPA compliant, "Black Box" with reporting software that will be capable of data storage to coincide with the NFPA requirements. Data storage capabilities will 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 will be downloadable by USB cable to a computer using either Microsoft or Apple operating systems.

SEAT BELT WARNING SYSTEM

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

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

THREE (3) SEATING POSITIONS

Seat belt and seat cushion sensors will be provided on the three (3) specified seating positions.

EXTERNAL CAB EMS COMPARTMENT – DRIVER SIDE

An externally accessible storage compartment will be mounted in the cab in lieu of the driver's side rearward facing crew seat.

The compartment will be approximately 23 7/8" deep x 41 3/4 " high x 22 3/4" wide.

The door opening will be approximately 35 7/8" high x 20" wide.

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

Lastly, it will be equipped with a hinged flush mount door hinged at the front of the compartment and an internal access door that is latched and painted. The exterior door will be held in the open position by a gas shock, stay arm.

LIGHTING

The EMS compartment will be equipped with A On Scene Solutions,

Access Series, and LED interior track light.

The lighting will be wired to automatically activate when the compartment door is open and the master battery switch is in the "on" position.

ADJUSTABLE SHELF

An adjustable shelf will be provided in the driver side EMS compartment. The shelf will be constructed from 3/16" brush aluminum mounted to uni-strut tracking material.

GLOVE BOX

There will be a keyed locking glove box with a hinged door on the right side of the main dash.

A light will be provided in the glove box with an integral push button switch controlled by the door.

HVAC CONTROLS

HVAC controls will 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 will be clearly labeled, adequately backlit.

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

HEATER / DEFROSTER & ACCESSORIES

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

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

The ceiling mounted external evaporator/heater unit will 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.
- Seven (7) vents will be provided on the HVAC unit for crew comfort.
- Damper controls will 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 will be fully insulated and enclosed.
- BTU: 55,300 A/C
- BTU: 78,000 Heat
- CFM: 680 Heat as mounted in the cab
- CFM: 680 A/C as mounted in the cab

The ceiling mounted evaporator unit will 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 will be drained by a gravity system to the inside of the cab wheel well area.

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

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

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

The system will utilize one (1) Valeo TM-31 HD engine mounted compressor driven by a Poly "V" serpentine belt installed in accordance with the manufacturer's requirements. The system will use R134a refrigerant. The air conditioner lines will be EATON GH001 EverCool SAE J2064 Type E hose secured using EATON E-Z Clip system components.

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

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

Heater-defroster will have a three-speed electric fan with illuminated controls. The controls system will 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 will have first priority to be load managed. The heater/defroster unit will clear the windshield in half-the-time required by SAE standards.

PAINT ROOF MOUNTED CONDENSOR

The roof mounted, air conditioning, condenser housing will be painted to match the cab roof color.

CAB TILT SYSTEM

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

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

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

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

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

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

The two (2) rear cab latches will be of the hydraulic pressure release, automatic re-latching type and provide an automatic positive lock when the cab is lowered.

The tilt pump will be electric over hydraulic type, with a pressure rating of not less than 4,000 PSI. Additionally, the cab tilt device will be both electrically and hydraulically interlocked to prevent inadvertent activation of the cab tilt system.

- A "CAB NOT LATCHED" indicator will be provided in the cab dash-warning cluster.
- A dual switch control system will be provided for the cab tilt, located on the passenger side of the vehicle or on the optional tether control. System will consist of two (2) position toggle switch along with a rubber covered push button momentary switch, which must be activated for the cab to raise or lower.

MANUAL CAB TILT

An auxiliary, manual cab, lift backup system will 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 will be provided as loose equipment.

PARKING BRAKE / CAB TILT INTERLOCK

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

FRAME ASSEMBLY

The chassis frame will be assembled in its entirety at the manufacturer's facility. This will prevent any split responsibility in warranty or service.

The frame will consist of two (2) channels fastened together by cross members.

All structural fasteners used in the frame will be Grade 8 hardware. Hardened steel washers will be used under all bolt heads and nuts to avoid stress concentrations. Top flange will be free of bolt heads. All spring hangers will be machined steel castings. Frame assemblies that are welded or assembled with "Huck" type fasteners are not acceptable."

Each main frame rail will 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.

A full length inner frame liner 9.44" X 3.63" X 3/8" will be installed. Total section modulus of each rail, with liner, will be 33.56 cu in and the total resisting bending moment (RBM) will be a minimum of 3,691,050 in-lbs, per rail.

The chassis frame assembly, consisting of frame rails, cross members, axles and steering gear(s), will 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 will be cleaned, primed and painted prior to being attached to the frame rails.

FRONT BUMPER

A 12" high, 101" wide, two (2) ribbed, bright finish, stainless steel, front bumper will be provided.

The bumper will be a wrapped design to match the contour of the front cab sheet.

FRONT BUMPER EXTENSION

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

CENTER WELL

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

TWO (2) VELCRO STRAPS ON CENTER WELL

The center, front bumper hose well will be furnished with Velcro straps to secure the hose stored in the well.

The straps will be attached to each side of the hose well with footman loops.

DRI-DEK MATERIAL IN CENTER WELL

The center storage well will be equipped with Dri-Dek material to provide drainage and ventilation of equipment in storage well.

CENTER WELL - GENERAL STORAGE

The center storage well will be utilized for general storage of tools or equipment. The well will be a large as space allows.

TOW EYES

Two (2) front chrome plate steel tow eyes will be fastened directly to the bumper support structure that extends below the bumper.

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

FRONT AXLE

The Steertek NXT front axle beam will 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 will incorporate a removable kingpin feature for ease of kingpin serviceability. The knuckles will 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 will also utilize premium kingpin bushings and seals to provide enhanced protection from the elements to improve bushing life. Oil seals with viewing window will be provided.

The suspension will 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 will 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 will be provided with the front suspension assembly. The shocks will be specially developed for parabolic leaf springs with a digressive characteristic curve using a patented piston system. The shocks will feature multi-stage piston and base valves. The combination of valves will achieve the desired damping characteristics that are ideal for the application.

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

CRAMP ANGLE

The cramp angle of the front axle shall be 45 degrees.

STEERING SYSTEM

A dual power steering system will 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 will increase performance in turning the officer side wheel assembly, reducing loads and forces on the main gear and components.

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

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

STEERING COLUMN

The steering column will be a "Douglas Autotech" tilt and telescope column. A lever mounted on the side of the column will control the tilt and telescope features.

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

There will be an ergonomically designed, self-canceling lever, that will control the following functions:

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

STEERING WHEEL

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

REAR AXLE

Rear axle will be a single, Meritor RS-26-185 with a capacity of 27,000 lbs.

The rear axle will be a single reduction axle with hypoid gearing and oil-lubricated wheel bearings.

Oil seals will be provided as standard equipment.

REAR BRAKES

Brakes will be "S" Cam, 16-1/2" x 8 5/8" size, and will be full air actuated with automatic, slack adjusters.

VEHICLE TOP SPEED NFPA STATEMENT

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

TIRE CHAINS

The vehicles rear drive axle will be equipped with an On-Spot, 6 strand tire chain system.

The system will utilize the existing vehicle air compressor system. A switch will be provided in the driver's console area to control the activation of the chains.

The switch will have a safety feature, which does not allow for inadvertent activation.

REAR SUSPENSION

The rear suspension will be a mechanical leaf type, variable rate with a 27,000 lb. rating. The main spring assembly will consist of 11 leaves with the main spring measuring 60.5" L x 3" W, 1 pad/spacer and 2 radius rod leaves for 14 total leaves.

Location of the suspension will be maintained with a single or double radius leaf" via a durable maintenance free rubber "pin" type bushing. The axle rating will be designed to match or exceed the rear axle weight rating.

FRONT WHEELS

The front wheels will be 22.5" x 12.25" ten stud, hub piloted, steel disc type painted job color.

FRONT WHEEL LUG & HUB TRIM

The steel disc, front wheels will be provided with bright, nut covers and hub caps.

FRONT TIRES

The front tires will be Goodyear 385/65R22.5, "18 Ply", tubeless, radial G296 MSA, on/off road tread.

The tires will be fire service rated up to 20,050 lbs and will have a top speed of 68 mph when inflated to 120 psi.

REAR WHEELS

The rear wheels will be 22.5" x 8.25" ten stud, hub piloted, steel disc type painted job color.

REAR WHEEL LUG & HUB TRIM

The single rear axle, steel disc wheels will be provided with bright, nut covers and hub caps.

REAR TIRES

The rear tires will be Goodyear 12R22.5, "16 Ply", tubeless, radial, G622 RSD, traction tread. The tires will be fire service rated up to 29,020 lbs and will have a top speed of 75 mph when inflated to 120 psi.

TIRE PRESSURE MONITORING

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

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

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

AIR BRAKE SYSTEM

A dual circuit, air operated braking system, meeting the design and performance requirements of FMVSS -121 and the operating test requirements of NFPA 1901 current edition will be installed.

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

ABS SYSTEM

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

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

To improve service trouble shooting, provisions in the system for an optional diagnostic tester will be provided. The system will test itself each time the vehicle is started. A dash-mounted light will go out once the vehicle has attained 4 mph after successful ABS start-up. A warning light will signal malfunction to the operator. The system will consist of a wheel mounted toothed ring, sensor, sensor clip, electronic control unit and solenoid control valve. The sensor clip will hold the sensor in close proximity to the toothed ring.

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

AIR RESERVOIRS

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

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

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

A pressure protection valve will 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 will be painted black.

STAINLESS STEEL AIR TANK BRACKETS

Stainless steel, air tank clamps will be provided to secure the air tanks to the chassis frame.

<u>1/4 TURN DRAIN VALVES SIDE OF BODY</u>

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

The brass, quarter turn, air tank drains will 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

A Meritor/Wabco System Saver 1200, heated air dryer will be furnished. An automatic, moisture ejector on the primary will also be furnished.

COLOR CODED BRAKE LINES

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

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

WABCO AIR COMPRESSOR

Air compressor will 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 will be the quick build up type. The air compressor discharge line will be stainless steel braid reinforced Teflon hose.

The chassis air system will meet NFPA 1901, latest edition for rapid air pressure build-up within sixty (60) seconds from a completely discharged air system.

This system will provide sufficient air pressure so that the apparatus has no brake drag and is able to stop under the intended operating conditions following the sixty (60) seconds build-up time.

BRAKE TREADLE VALVE

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

PARKING BRAKE CONTROL

Parking brake will be of the spring-actuated type, mounted on the rear axle brake chambers. The parking brake control will be mounted on the driver lower wing panel.

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

ENGINE

Engine will be a Cummins, Model L9 450, diesel, turbo-charged, electronically controlled, per the following specifications:

- Maximum Horsepower 450 HP @ 2100 RPM
- Governed Speed 2200 RPM

- Peak Torque 1250 lb. ft. @ 1200 RPM
- Cylinders Six (6)
- Operating Cycles Four (4)
- Bore / Stroke 4.49 x 5.69 in.
- Displacement 543 cu. in.
- Compression Ratio 16.6:1
- Governor Type Limiting Speed

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

ENGINE IQA CERTIFICATION

The Cummins L9 engine will be certified by Cummins Power Systems for installation in the manufacturers custom chassis.

SECONDARY BRAKING

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

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

ENGINE AIR CLEANER

An engine air cleaner will be provided. The air cleaner will include a dry type element and will be installed in accordance with the engine manufacturer's recommendations.

The air cleaner will 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 will be easily accessible when the cab is tilted.

The air cleaner will be plumbed to the air intake system that will 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 will be on the side of the cab on the driver's side.

The inlet will 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.

EMBER SEPARATOR

An ember separator will be installed in the chassis air intake system. The ember separator housing must be easily accessible when the cab is tilted.

ACCELERATOR PEDAL

A floor mount accelerator pedal will be installed on the floor in front of the driver.

The pedal will be positioned for comfort with ample space for fire boots and adequate clearance from the brake pedal control.

REMOTE THROTTLE & INTERLOCK HARNESS

An apparatus interface wiring harness for the engine will be supplied with the chassis. If applicable, separate circuits will 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 will be turned off for use with a J1939 based pump controller or when the discreet wire remote throttle controls are not required.

COOLING SYSTEM

Radiator and charge air cooler will be aluminum with welded aluminum top and bottom tanks.

The cooling system will be designed for a maximum of fifteen (15) PSI operation. There will be a sight glass on the surge tank to check the coolant level without removing the radiator cap.

The core construction will be aluminum bar/plate. Fin density should be a maximum of ten (10) fins per inch.

Core area will be a minimum of 1525 square inches (48.5" H x 31.5"W).

COOLING SYSTEM CRITERIA

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

TRANSMISSION COOLER

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

The cooler will have an aluminum shell and copper tubes.

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

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

RADIATOR CROSS MEMBER

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

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

CHARGED AIR COOLER

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

The charge air cooler will be mounted directly ahead of the radiator and to the radiator headers.

Rubber isolators will be used at the mounting points to reduce transmission of vibrations.

The connections between the engine and charged air cooler, will 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

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

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

Recirculation shields will be installed to ensure that air which has passed through the radiator is not drawn through it again.

HEATER AND COOLANT HOSES / PIPING

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

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

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

LOW COOLANT INDICATOR

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

TRANSMISSION

An Allison World Transmission, Model 3000 EVS electronically controlled, automatic transmission will be provided.

Transmission specifications will be as follows:

- Maximum Gross Input Power 450 HP
- Maximum Gross Input Torque 1250 lb. ft.
- Input Speed (Range) 2000- 2800 RPM
- Direct Gear (Pumping) 4th (Lock-up)

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

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

One (1) PTO opening will be provided on both the left and right side of the converter housing (positions four (4) o'clock and eight (8) o'clock).

FIVE (5) SPEED AUTOMATIC TRANSMISSION

The transmission will be calibrated for five (5) forward gears and one (1) reverse gear. Each gear will have the following ratios:

- First 3.49:1
- Second 1.86:1
- Third 1.41:1

- Fourth 1.00:1
- Fifth 0.75:1
- Reverse -5.03:1

ALLISON TRANSMISSIONS TOUCH PAD SHIFTER

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

Shift control will be approved by the transmission manufacturer.

TRANSMISSION OIL LEVEL SENSOR

The transmission will be equipped with the oil level sensor (OLS); this sensor will allow the operator to obtain an indication of the fluid level from the shift selector.

The sensor display will provide the following checks, correct fluid level, low fluid level and high fluid level.

ALLISON PARK TO NEUTRAL

The transmission, upon application of the parking brake, will automatically shift into neutral. **ALLISON PRESELECT PROGRAMMING**

The transmission will have Allison Preselect enabled to automatically downshift when the secondary engine brake is active.

PRESELECT PROGRAMMED FOR 2ND GEAR

The transmission will be programmed to automatically downshift to 2nd gear. This feature will be enabled/disabled with the main on/off switch for the engine brake.

TES 295 SYNTHETIC TRANS FLUID 3000EVS

TES 295 transmission fluid will be utilized to fill the 3000 EVS transmission.

TRANSMISSION LOCK-UP

The automatic transmission furnished in the chassis will 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 will be provided to prevent vehicle movement during pumping operations.

The air brakes furnished must satisfy this requirement.

DRIVE LINES

Drive lines will be Dana (Spicer) 1710 heavy duty series or equal, with "glide coat" splines on all slip shafts.

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

The manufacturer will provide proof of compliance with all drive shaft manufacturer's standards and specifications.

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

DEF TANK

A five (5) gallon diesel exhaust fluid (DEF) tank will be provided and installed. The tank will be mounted in the area of the battery box and will be accessible through a door in the crew area step well.

The tank will 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 will 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 will be provided with the DEF tank and connected to the level gauge on the dashboard.

DIESEL EXHAUST FLUID LEVEL GAUGE

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

EXHAUST SYSTEM

The exhaust system will be installed in accordance with the engine manufacturer's requirements and meet all Environmental Protection Agency and State noise level requirements. Exhaust system components will be securely mounted and easily removable.

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

Exhaust tubing will 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 will be HDT stainless steel type.

To minimize heat build-up, exhaust tubing within the engine compartment will be wrapped with an insulating material. Exhaust will be wrapped from the turbocharger to the entrance of the muffler. Material will be held in place with worm gear type clamps.

An exhaust diffuser will 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 will be provided under the dashboard on the driver's side. Each switch will be provided with a spring loaded protective cover and will be clearly marked as to function. If the electrical system is Class-1 ES-key, the regeneration switches will be incorporated into the ultraview screen.

The vehicle will 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 will 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

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

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

PLYMOVENT EXHAUST EXTRACTION SYSTEM TAILPIPE ADAPTER

The exhaust outlet will be a straight pipe, forward of the rear axle. It will be terminating minimum 6" forward of rear tire, minimum 2.5" below rub rail/body, and flush with outboard of rub rail/body to connect with a pneumatic Plymovent ventilation system.

FUEL TANK

Fuel tank will be a minimum of fifty (50) gallon capacity. It will have a minimum fuel filler neck of 2" ID and 1/4 turn fill cap. A 1/2" minimum diameter drain plug will be provided. The tank will be fabricated from hot rolled, pickled and oiled steel. Provisions for an additional feed line and fuel level float will be provided for future use.

The fuel tank will be installed behind the rear wheels between the frame rails. The fuel tank will meet all FHWA 393.67 requirements including a fill capacity of 95% of tank volume. The fuel tank will 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 will be performed at and verified by a third party testing and evaluation center.

STAINLESS STEEL FUEL TANK STRAPS

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

FUEL TANK MOUNTING STRAP ISOLATION MATERIAL

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

FUEL LINES

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

FUEL-WATER SEPARATOR

A fuel filter/water separator will be provided in the fuel system. A "water in fuel" indicator will be provided on the information center.

ELECTRIC FUEL PUMP

An electric fuel pump for re-priming will be furnished in the main fuel line. A labeled control switch will be provided on the main dash panel.

FUEL POCKET

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

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

PUMPER BODY ELECTRICAL

CHASSIS ELECTRICAL SYSTEM

All electrical wiring in the chassis will 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 will be routed in protective, heat resistant loom, securely and neatly installed. Two (2) power distribution centers will be provided in central locations for greater accessibility. The power distribution centers will 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 will have a capacity substantially greater than the expected load on the related circuit, thus ensuring long component life. Power distribution centers will 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 will 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 will be electrically tested prior to installation to ensure the highest system reliability.

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

12 VOLT ELECTRICAL SYSTEM TESTING

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

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

The engine will 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 will be shut off and the minimum continuous electrical load will be activated for 10 minutes. All electrical loads will be turned off prior to attempting to restart the engine. The battery system will then be capable of restarting the engine. Failure to restart the engine will be considered a test failure.

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

The total continuous electrical load will be activated with the engine running up to the engine manufacturers governed speed. The test duration will be a minimum of 2 hours. Activation of the load management system will 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, will be considered a test failure.

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

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

At the time of delivery, documentation will 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

The wiring harness contained on the chassis will 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 will be uniquely identified by color code or circuit function code, labeled at a minimum of every three (3) inches. The identification of the wiring will 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 will 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 will have a minimum rating of 289° Fahrenheit.

All circuits will 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

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

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

EMI / RFI PROTECTION

The apparatus will 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 will 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

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

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

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

MULTIPLEX CONTROL PUMP SHIFT SWITCH

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

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

CLASS-1 ES-KEY MULTIPLEX ELECTRICAL SYSTEM

A Class 1 ES-Key Electrical Management System will be utilized on the chassis for all functions applicable.

The system will consist of the following components:

A Modem with a RS232 computer interface and standard telephone jack used to not only program the multiplex system but also serve as a factory direct gateway into the vehicle from any Class 1 multiplex authorized service facility.

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

The ES-Key system installation will comply with SAE J 551 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 will be installed. The Input/Output modules will permit the multiplexing system to reduce the amount of wiring and components used as compared to non-multiplexed apparatus. These modules will vary in I/O configuration, be waterproof allowing installation outside of enclosed areas and will possess individual output internal circuit protection. The modules will also have three status indicators visible from a service persons vantage point that will indicate the status of the module. In the event a load requires more than 7.5 AMPS of operating current, the module will activate a simple relay circuit integral to any of the 3 dillbox assemblies installed in the cab.

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

REAR VISION CAMERA DISPLAYED IN MULTIPLEX SCREEN

The video output from the camera will be displayed on the UltraView, display panel.

INTER-LOCK MODULE FOR MULTIPLEX SYSTEM

A Vocation Module, which is the interface between the multiplexing system and the pump system will be provided.

This module will serve as the interface between the operator, engine, transmission and pumping system.

The module will be installed under the driver's side dash, in a sealed enclosure that will possess green indicating LEDs that will indicate to service personnel the interlock state of the apparatus.

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

In addition to controlling pump function, this vocation module will be able to provide automatic and/or manual activation of engine "Fast Idle", to maintain adequate alternator output and thus, chassis voltage.

ALTERNATOR

There will 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 will 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 will carry a three (3) Year/Unlimited Mile warranty.

BATTERIES

Three (3) Exide #31XHD, maintenance free batteries will be provided. These batteries will be wired in parallel to the master disconnect switch.

Each battery will be rated at 925 CCA at 0 F and will have a reserve capacity of 180 minutes. Wiring for the batteries will be 4/0 welding type, dual path starting cables per SAEJ541.

BATTERY STORAGE

Batteries will be securely mounted in a fixed 3/16" GR50 steel tray, located on the driver's side of the chassis frame.

Complete access will be provided when the cab is fully tilted. Batteries will be mounted on noncorrosive matting material.

The battery tray will 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 will be performed at and verified by a third party testing and evaluation center.

COLE HERSEE BATTERY JUMPER STUDS

A set of Cole Hersee battery jumper studs, model #46210-02 (red) and #46210-03 (black) will be provided to allow the battery system to be jump started or charged from an external source.

The studs will be located on the back wall of the drivers step well.

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

BATTERY DISCONNECT SWITCH

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

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

SHORELINE INLET

One (1) Kussmaul "Super" Auto Eject model 091-55-20-120, automatic, 120 volt, 20 amp shoreline disconnect will be provided for the on board, 110 volt battery charging systems.

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

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

A label will be provided indicating voltage and amperage ratings.

SHORELINE INLET COVER

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

SHORELINE INLET LOCATION

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

SHORELINE INLET LABEL

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

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

BATTERY CHARGER

A Kussmaul model # 091-170-12, "Auto Charge 12 HO" high output, fully automatic battery charger will be provided for maintaining the vehicle battery system.

Remote voltage sensing will be provided to compensate the charger output for the voltage drop in the charging wires.

Output current will be 20 amperes @ 12 volt DC. A built-in ammeter will be provided.

BATTERY CHARGER STATUS CENTER

A Kussmaul Super Auto Eject Deluxe Cover With Bar Graph Display will be provided.

CAB INSTRUMENTS

The main instrument panel will be centered in front of the driver and will have a hinged bottom with two $\frac{1}{4}$ turn latches at the top.

The panel will contain the primary gauges, an instrument warning light cluster and the ignition and engine start switches.

The lower portion of this panel can be used for the installation of up to five (5) guarded type rocker switches.

Examples of the switches that will be installed in this area are automatic chains, fan clutch override, ATC mud-snow, inter-axle diff lock, electric fuel pump, all-wheel drive, etc.

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

Gauges will also possess an integral red warning light with a pre-programmed warning point.

Gauge warning indicators will be capable of activating an audible alarm inside the dashboard.

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

CAB DASH PANELS

The apparatus cab will be outfitted with dash and overhead panels. These panels will be utilized across the entire front of the cab dash and include the instrument cluster and brow panels. The panels will 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 will be provided.

STANDARD #MATM RADIO ANTENNA

An antenna mounting base model #MATM with 17' of coaxial cable will be provided and installed on the lower cab roof, behind the light bar.

The attached antenna wires will be run to the right side cab dash area.

Mohegan Fire Company is responsible to have the correct antenna whip installed once the apparatus is delivered.

CONTROL SWITCHING THROUGH MULTIPLEX SCREEN

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

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

HOSE BED WORK LIGHT SWITCH

The hose bed work light will 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 BEHIND FRONT CAB DOOR LIGHTS

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

CONTROL SWITCH IN CAB FOR REAR OF BODY LIGHTS

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

CONTROL SWITCH IN CAB FOR DRIVER SIDE OF BODY LIGHTS

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

CONTROL SWITCH IN CAB FOR OFFICER SIDE OF BODY LIGHTS

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

WHELEN 6" ROUND WHITE / RED LED INTERIOR LIGHTS

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

Each dome light will have individual switches to control the red or white LEDs. Each dome light will also activate when the respective, adjacent cab door is opened.

ENGINE COMPARTMENT WORK LIGHTS

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

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

BLUE SEA #4365 ACCESSORY PANEL

A Blue Sea model 4365 accessory panel will be provided. The accessory panel will 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 will be mounted in the center dash panel.

BLUE SEA #4365 ACCESSORY PANEL

A Blue Sea model 4365 accessory panel will be provided. The accessory panel will 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 will be installed in the rear of the cab on the back of the engine enclosure.

POWER POINT FOR DRIVER SIDE EMS COMPARTMENT

The driver side EMS compartment will be equipped with a Blue Sea 5025 power point with power and ground connections conveniently positioned in the upper area inside the compartment, connected directly to the chassis batteries.

POWER AND GROUND STUD FOR ACCESSORIES IN DASH

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

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

BLUE SEA FUSE BLOCK - 12 CIRCUIT BEHIND OFFICER SEAT

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

This block has a maximum amperage of 60 Amps per block and 30 Amps per circuit.

IGNITION STUD - REAR CREW AREA

An ignition stud will be installed in the rear crew area for items needing an ignition circuit (i.e., mobile radio).

This stud has a maximum amperage of 20 Amps.

INSTRUMENT PANEL

The main instrument panel will be centered in front of the driver and will have a hinged bottom with two $\frac{1}{4}$ turn latches at the top.

The panel will contain the primary gauges, an instrument warning light cluster and the ignition and engine start switches.

The lower portion of this panel can be used for the installation of up to five (5) guarded type rocker switches.

Examples of the switches that will be installed in this area are automatic chains, fan clutch override, ATC mud-snow, inter-axle diff lock, electric fuel pump, all-wheel drive, etc.

The main instrument panel will contain the primary gauges.

An ignition and engine start switch will be located on a panel to the left upper portion of the driver's side dash panel.

Additional auxiliary control switches and instruments will be located within the dash panel and overhead panel located near the driver's position.

INDICATOR CLUSTER

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

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

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

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

On the Road displays include:

- Two (2) configurable displays that can show any of the parameters the unit collects. This includes odometer, trip information, fuel economy information; all gauge data, and virtually any other data available on the vehicle that the display has access to, either through the data bus or via analog inputs.
- Two (2) trip displays for miles and hours that are capable of being reset.

• Two (2) fuel data screens: will be provided; one for fuel remaining until empty and one for fuel economy. The fuel economy display will be capable of being reset so that average economy over a predetermined period can be displayed.

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

- Engine hours as maintained by the engine ECU
- Service Alarm screens to report miles to next service or miles past required service. These screens will allow the operator to choose the length of the service interval and will have the ability to reset it.
- Message screens with warning messages the display has collected during the current ignition cycle. These screens will be divided into configured warnings such as "Low Air Pressure" and the data bus faults reported by ECU's on the vehicle. Both lists will allow the operator to review the last 12 events that occurred on the vehicle for maintenance and troubleshooting purposes.
- Diagnostic screens will test the instrumentation system to verify it is working correctly.
- Setup screens will be used to select either English or metric display. They will also allow the operator to choose the data that will be displayed by the configurable on-the-road screens.

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

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

•	"Exhaust High Temperature"	(amber in color)
•	"Engine Diagnostic Fault"	(amber in color)
•	"Retarder On"	(green in color)

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

•	"Wait To Start" indicator	(amber in color)
•	"Exhaust System Fault"	(amber in color)
•	"Topps System Fault"	(amber in color)
•	"Lube System Active"	(amber in color)
•	"Jacks Not Stowed"	(red in color)
•	"PTO Engaged"	(green in color)
•	"Inter Axle Lock"	(amber in color)
•	"Driver Controlled Diff Lock"	(green in color)
•	"Ok to Pump"	(green in color)
•	"Auto Traction Control"	(amber in color)
•	"Retarder Active"	(amber in color)
•	"Auxiliary Brake Active"	(amber in color)

DRIVER INDICATOR CLUSTER

Each gauge will have a raised glass lens with a black matte finish trim ring and be backlit by integral white LEDs. Each gauge will also possess an integral red warning light with a preprogrammed warning point. Each gauge warning indicator will be capable of activating an audible alarm inside the dashboard.

The primary gauges will consist of:

- Vehicle speedometer (0-80 mph)
- Engine tachometer (0-3000 rpm)
- Engine oil pressure (0-100 psi); low oil pressure warning
- Engine coolant temperature (100-250 °F); high engine temp warning (based on engine)
- Transmission oil temperature (100-350 °F); high transmission fluid temp warning
- Vehicle battery voltage (9-18 VDC); low voltage warning at 11.8 amps
- 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 @ 1/8 tank
- Air cleaner restriction gauge (0 40), warning at 25" restriction.

ENGINE COMPRESSION BRAKE CONTROLS

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

CLASS-1 ES-KEY ULTRAVIEW 780 DISPLAY

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

The screen will be programmed with the following features:

- Chassis Instrument Display
- Back-up camera
- 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
- Gauge back-light dimming
- Rocker switch back-light dimming
- Display screen dimming with day/night feature
- Multiplex system diagnostics

FAST IDLE

A fast idle for the electronic controlled engine will be provided. The fast idle will be controlled by an ON/OFF switch on the left side of the main gauge panel.

An electronic interlock system will 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 will be properly interlocked with the engagement of the specified component or accessory.

PUMP SHIFT CONTROL

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

CAMERA SYSTEM

An ASA Voyager rear vision camera model # VCMS155 will be provided to allow the driver to visually see the rear of the apparatus while in the cab. The rear vision camera will be mounted on

the rear of the apparatus and will be wired to automatically activate when the chassis transmission is placed in reverse.

CAMERA SYSTEM

An ASA Voyager rear vision camera model # VCMS50 will be provided to allow the driver to visually see the officer side of the apparatus while in the cab. The side vision camera will be mounted on the officer side of the cab and will 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.

CUSTOM PUMPER CHASSIS LED MARKER LIGHTS

DOT MARKER LIGHTS AND REFLECTORS

OPTRONICS LED MARKER LIGHTS - FRONT ROOF EDGE OF CAB

Five (5) amber DOT approved, Optronics MCL13 Light Emitting Diode (LED) cab marker lamps will be mounted on the front upper edge of the cab, above the windshield.

CAB STEP LIGHTS

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

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

DUAL MODULE WITH WHELEN 600 LED TURN SIGNALS

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

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

LED PETERSON HEADLIGHTS

Two (2) dual, Peterson LED headlight modules with a bright finish bezel will be furnished, one (1) each side, on the front of the cab.

Each head light module will incorporate an individual LED low beam and a LED high beam headlight.

High beam actuation will be controlled on the turn signal lever.

DAYTIME RUNNING LIGHTS

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

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

NFPA COMPLIANT WARNING LIGHT PACKAGE

The following warning light package will include all of the minimum warning light and actuation requirements for the current revision of the NFPA 1901 Fire Apparatus Standard.

The lighting as specified will 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

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

LIGHT PACKAGE ACTUATION / CONTROLS

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

The warning light system specified above will 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) will be certified by the light system manufacturer, to meet all of the requirements in the current revision of the NFPA 1901 Fire Apparatus Standard as noted in the General Requirements section of these specifications.

The NFPA required "Certificate of Compliance" will be provided with the completed apparatus.

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

LIGHT BAR

A Whelen # F4N7QLED "Edge Freedom Series IV", 72" cab roof warning light bar will be furnished and rigidly mounted on top of the cab roof.

The light bar will 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 will be automatically disabled for the "Blocking Right of Way" mode.

3M LED OPTICOM EMITTER

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

UPPER ZONE C LIGHTING

Two (2) Whelen, C9, super LED light heads will 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 - CELAR

The upper zone C warning lights will include red LEDs and a clear lens.

UPPER ZONE C WARNING LIGHT BEZEL - CHROME

The upper zone C warning lights will include a chrome bezel.

UPPER ZONE B/D FRONT LIGHTING

Two (2) Whelen, C9, super LED light heads will 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 FRONT WARNING LIGHT LENS - CLEAR

The upper zone B/D front warning lights will include red LEDs and a clear lens.

UPPER ZONE B/D FRONT WARNING LIGHT BEZEL - CHROME

The upper zone B/D front warning lights will include a chrome bezel.

UPPER ZONE B/D REAR LIGHTING

Two (2) Whelen, C9 super LED light heads will 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 will be installed with a chrome plated mounting flange.

UPPER ZONE B/D REAR WARNING LIGHT LENS - CLEAR

The upper zone B/D rear warning lights will include red LEDs and a clear lens.

UPPER ZONE B/D REAR WARNING LIGHT BEZEL - CHROME

The upper zone B/D rear warning lights will include a chrome bezel.

LOWER ZONE A FRONT MOUNTING

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

LOWER ZONE A FRONT LIGHTING

Two (2) Whelen C6 super LED light heads will be provided and installed one (1) each side.

LOWER ZONE A WARNING LIGHT LENS - CLEAR

The lower zone A warning lights will include red LEDs and a clear lens.

LOWER ZONE A WARNING LIGHT BEZEL - CHROME

The lower zone A warning lights will include red LED's and a chrome bezel.

LOWER ZONE C REAR

Two (2) Whelen, C6, super LED light heads will be provided and installed one (1) each side directly below the DOT stop, tail, turn and backup lights.

LOWER ZONE C WARNING LIGHT LENS - CLEAR

The lower zone C warning lights will include red LEDs and a clear lens.

LOWER ZONE B/D FRONT MOUNTING

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

LOWER ZONE B/D FRONT LIGHTING

Two (2) Whelen, C6 super LED light heads will be provided and installed with one (1) on each side.

LOWER ZONE B/D FRONT WARNING LIGHT LENS - CLEAR

The lower zone B/D front warning lights will include red LEDs and a clear lens.

LOWER ZONE B/D FRONT WARNING LIGHT BEZEL - CHROME

The lower zone B/D front warning lights will include a chrome bezel.

LOWER ZONE B/D MID LIGHTING

Two (2) Whelen, C6 super LED light heads will be provided and installed with one (1) on each side.

LOWER ZONE B/D MID WARNING LIGHT LENS - CLEAR

The lower zone B/D mid warning lights will include red LEDs and a clear lens.

LOWER ZONE B/D MID WARNING LIGHT BEZEL - CHROME

The lower zone B/D mid warning lights will include a chrome bezel.

LOWER ZONE B/D REAR LIGHTING

Two (2) Whelen C6 super LED light heads will be provided and installed with one (1) on each side.

LOWER ZONE B/D REAR WARNING LIGHT LENS - CLEAR

The lower zone B/D rear warning lights will include red LEDs and a clear lens.

LOWER ZONE B/D REAR WARNING LIGHT BEZEL - CHROME

The lower zone B/D rear warning lights will include a chrome bezel.

PAIR OF WHELEN 21.5" - "F4NMINI" LED LIGHT BARS

A pair of Whelen model F4NMINI, 21.5" Freedom, cab roof warning light bars will 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 will 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 will be automatically disabled for the "Blocking Right of Way" mode.

The lights specified above will be provided in addition to the NFPA required Optical Warning Light Package and will be switched independently from the light package.

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

GROUND LIGHTS

One (1) TecNiq LED, 6" long ground light with stainless steel mounting bracket, will be provided under each side cab door entrance step, four (4) total.

The ground lights will 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 will illuminate an area at a minimum 30" outward from the edge of the vehicle.

GROUND LIGHTS UNDER FRONT BUMPER

One (1) TecNiq LED, 6" long ground light with stainless steel mounting bracket, will be provided under each side of the front bumper facing forward, two (2) total.

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

GROUND LIGHTS BELOW PUMP PANEL RUNNING BOARD

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

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

GROUND LIGHTS REAR BODY CORNERS

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

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

CHASSIS DIAGNOSTICS SYSTEM

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

The diagnostic system will 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

A voltage monitoring system will be provided to indicate the status of the battery system connected to the vehicle's electrical load. The system will provide visual and audible warning when the system voltage is below or above optimum levels. The alarm will activate if the system falls below 11.8 volts DC for more than two (2) minutes.

INDICATOR LIGHT AND ALARM PROVE-OUT SYSTEM

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

ELECTRICAL HARNESS INSTALLATION

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

- SAE J 1128 Low tension primary cable
- SAE J 1292 Automobile, truck, truck-tractor, trailer and motor coach wiring
- SAE J 163 Low tension wiring and cable terminals and splice clips
- SAE J 2202 Heavy duty wiring systems for on-highway trucks
- NFPA 1901 Standard for automotive fire apparatus
- FMVSS 302 Flammability of interior materials for passenger cars, multipurpose passenger vehicles, trucks and buses
- SAE J 1939 Serial communications protocol

- SAE J 2030 Heavy-duty electrical connector performance standard
- SAE J 2223 Connections for on board vehicle electrical wiring harnesses
- NEC National Electrical Code
- SAE J 561 Electrical terminals Eyelet and spade type
- SAE J 928 Electrical terminals Pin and receptacle type A.

For increased reliability and harness integrity, harnesses will be routed throughout the cab and chassis in a manner which allows the harnessing to be laid into its mounting location. Routing of harnessing which requires pulling of wires through tubes is never allowed at the manufacturer.

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

- All holes made in the roof will be caulked with silicon. Large fender washers, liberally caulked, will be used when fastening equipment to the underside of the cab roof.
- Any electrical component that is installed in an exposed area will be mounted in a manner that will not allow moisture to accumulate in it. Exposed area will be defined as any location outside of the cab or body.
- For low cost of ownership, electrical components designed to be removed for maintenance will be quickly accessible. For ease of use, a coil of wire will be provided behind the appliance to allow them to be pulled away from the mounting area for inspection and service work.
- Corrosion preventative compound will be applied to non-waterproof electrical connectors located outside of the cab or body. All non-waterproof connections will require this compound in the plug to prevent corrosion and for easy separation of the plug.
- Any lights containing non-waterproof sockets in a weather-exposed area will have corrosion preventative compound added to the socket terminal area.
- All electrical terminals in exposed areas will have protective coating applied completely over the metal portion of the terminal.
- Rubber coated metal clamps will be used to support wire harnessing and battery cables routed along the chassis frame rails.
- Heat shields will be used to protect harnessing in areas where high temperatures exist. Harnessing passing near the engine exhaust will be protected by a heat shield.
- Cab and crew cab harnessing will not be routed through enclosed metal tubing. Dedicated wire routing channels will be used to protect harnessing therefore improving the overall

integrity of the vehicle electrical system. The design of the cab will allow for easy routing of additional wiring and easy access to existing wiring.

• All standard wiring entering or exiting the cab will 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 will conform to the following requirements:

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

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

- Splices will not be allowed on battery cables or battery cable harnesses.
- For ease of identification and simplified use, battery cables will be color coded. All positive battery cables will be marked red in color. All negative battery cables will be black in color.
- For ease of identification, all positive battery cable isolated studs throughout the cab and chassis will be red in color.
- For increased reliability and reduced maintenance, all electrical buss bars located on the exterior of the apparatus will be coated to prevent corrosion.
- An operational test will be conducted to ensure that any equipment that is permanently attached to the electrical system is properly connected and in working order.

BODY ELECTRICAL SYSTEM

All electrical lines in the body will be protected by automatic circuit breakers, conveniently located to permit ease of service.

Flashers, heavy solenoids and other major electrical controls will be located in a central area near the circuit breakers.

All lines will 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 will be supplied with the apparatus.

Wiring will be carefully protected from weather elements and snagging. Heavy duty loom will be used for the entire length.

Grommets will be utilized where wiring passes through panels.

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

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

POWER DISTRIBUTION MODULES FOR CLASS ONE ES-KEY

Class 1 Power distribution modules will 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 will be mounted in a location to provide complete access for service or trouble shooting.

DOOR OPEN INDICATOR WITH INTEGRAL AUDIBLE ALARM

An indicator light with an audible alarm, will 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 will be activated through the parking brake switch to signal when the parking brake is released.

DUNNAGE AREA LIGHTING

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

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

COMPARTMENT LIGHT ACTIVATION

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

COMPARTMENT LIGHTS

Each exterior compartment will have one (1) TecNiq LED model #E18 white dome light.

Each light will come on automatically when the respective door is opened and the master battery switch is on.

CUSTOM PUMPER BODY LED MARKER LIGHTS

OPTRONICS MARKER LIGHTS - FORWARD OF CAB DOOR

Optronics MCL series amber LED marker lights with reflector will be provided and mounted forward of the front cab door, one (1) each side.

OPTRONICS MARKER / TURN LIGHTS - EACH SIDE OF BODY

Optronics model MCL82RB, red, LED marker lights with integral reflectors will be provided at the lower side rear, having one (1) on each side.

Optronics Model #STL71AMB, yellow, LED side marker and turn lights will 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.

OPTRONICS MARKER LIGHTS - REAR OF BODY

Optronics MCL65, red, LED clearance lights will be provided on the apparatus rear upper having one (1) on each side at the outermost practical location.

Optronics MCL12, LED, 3-lamp identification bar will be provided on the apparatus rear center.

The lights will be red in color.

TRUCK-LITE DOT AMBER REFLECTORS - SIDE OF BODY

Truck-Lite # 98034Y, yellow reflectors will 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.

TRUCK-LITE DOT RED REFLECTORS - REAR OF BODY

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

LED LICENSE PLATE LIGHT

One (1) TecNiq model #L10 LED license plate light will be provided above the mounting position of the license plate.

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

WHELEN C6 LED BRAKE, REVERSE, TURN WITH QUAD HOUSING

Two (2) Whelen C6 series, 4-1/8" x 6-1/2", LED red combination tail and stop lights, will be mounted one each side at the rear of the body.

Two (2) Whelen C6 series, 4-1/8" x 6-1/2", LED amber arrow turn signal lights, will be mounted one each side, on a vertical plane with the tail/stop lights.

Two (2) Whelen C6 series, 4-1/8" x 6-1/2", LED white back-up lights, will be mounted one each side on a vertical plane with the turn/tail/stop signals.

These lights will activate when the transmission is placed in reverse gear.

Two (2) Whelen PLASC4V mounting flanges, installed one (1) on each side, will be provided to mount the lights described above in one common mounting flange.

The fourth opening will be for the lower rear warning lights. The lights will be mounted in order, from top to bottom, as described above.

BODY STEP LIGHTS

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

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

PUMP ENCLOSURE WORK LIGHTS

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

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

AMDOR LED STRIP HOSE BED LIGHT - FRONT HOSE BED WALL

One (1) Amdor, LED, strip surface mounted lights will be mounted in the hose bed on the front wall to illuminate the hose bed area.

WHELEN C9 SERIES LED SCENE LIGHTS BEHIND FRONT CAB DOORS

Two (2) Whelen, # C9SL, super LED scene lights will be provided, (1) one on each side of the cab, directly behind the front cab entrance door in a chrome plated flange.

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

WHELEN C9 SERIES LED SCENE LIGHTS ON REAR OF BODY

Two (2) Whelen, # C9SL, super LED scene lights will be provided, (1) one on each side of the rear body panel in a chrome plated flange.

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

REAR SCENE LIGHTS TO BE ACTIVATED BY REVERSE LIGHT

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

WHELEN C9 SERIES LED SCENE LIGHTS ON DRIVER SIDE OF BODY

Two (2) Whelen, # C9SL, super LED scene lights will be provided. The scene lights will be installed one rearward and one forward on the driver side of the body in a chrome plated flange.

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

WHELEN C9 SERIES LED SCENE LIGHTS ON OFFICER SIDE OF BODY

Two (2) Whelen, # C9SL, super LED scene lights will be provided.

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

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

WILL-BURT NIGHTSCAN

A Will-Burt Nightscan 1.8, model NS 1.8-600 WHL, surface mounted light tower will be provided and mounted as specified.

The light tower will be equipped with four (4) 150-watt, 12-volt Whelen LED spot/flood light fixtures to provide a total of 56,000 lumens of lighting.

The light tower weighs approximately 80lbs and requires 12 volts DC at 48 amps.

The light tower uses an RCP (Remote Control Positioner) attached to the top of the tower to allow full rotation and tilt of the light fixtures at any vertical height to ensure total scene coverage above or beside the vehicle.

The light tower extends to a maximum height of six (6) feet from the mounted surface.

The light towers functions including "auto stow" are operated by a pistol grip remote control.

The remote control will be mounted in a body compartment as specified.

WIRELESS HANDHELD CONTROLLER

A wireless, handheld controller will be provided and installed in place of a standard controller, in order to control the functions of the light tower.

An emergency, stop button will be provided on the junction box, next to where the controller is mounted, for added safety.

LIGHT TOWER LOCATION

The light tower will be mounted on the upper custom cab roof.

LIGHT TOWER MOUNTING CLARIFICATION

The light tower will be mounted on the rearward section of the flat roof cab.

REAR TRAFFIC WARNING LIGHT

One (1) Whelen LED "Traffic Advisor", model TAL65 36", rear directional light will be installed on the rear of the body.

The light will be equipped with six (6) lamps. The directional light will be activated by a control module.

The control module will be conveniently located near the driver's position. The rear directional light will be wired through the load management system of the unit.

TRAFFIC ADVISOR - MOUNTING ON THE REAR SHEET

The traffic advisor will be mounted on the rear sheet.

DOT HORN

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

BACK-UP ALARM

A Code 3, model # CA278, 87dBA back-up alarm, will be provided and installed at the rear of the apparatus under the tailboard.
The back-up alarm will activate automatically when the transmission is placed in reverse gear and the ignition is "on."

DUAL CHROME AIR HORNS

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

DUAL AIR HORNS

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

AIR HORN CONTROL

The air horns will be controlled by a push button, located on the dash on the officer's side, as well as the steering horn button for the driver.

An air horn/electric DOT horn, selector switch will be furnished on the dash for the drivers steering horn button.

ELECTRONIC SIREN

One (1) Whelen # 295SL100, 100 watt electronic siren will be provided featuring: bottom mount control head in cab, "Si-Test" self-diagnostic feature, six (6) function siren, radio repeat, and public address.

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

ELECTRONIC SIREN SPEAKER

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

MECHANICAL SIREN

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

SIREN LOCATION

The Q2B siren will be pedestal mounted on top of the extended bumper on the driver's side. The siren will be equipped with a Federal model #P, chrome housing and pedestal.

SIREN CONTROL

A floor mounted foot switch will be provided for the driver. A siren brake button will be provided near the driver's position.

Q2B ACTIVATION / BRAKE

A second push button Q2B activation/brake switch will be provided on the cab dash near the officers seating position. The top portion of the switch will activate the Q2B and the lower portion will activate the brake. Both will be momentary operation.

WEATHER BAND AM / FM / WX / CD STEREO

A Weather Band/AM/FM, CD, MP3, Satellite ready player with a wireless remote will be installed in the cab overhead panel as space allows.

The speakers will be located as follows:

(2) 6 inch mounted in the Front of the cab

(2) 6 inch mounted in the Rear of the cab

A heavy duty flexible base antenna will be provided on the cab.

HALE QMAX-200 2000 GPM SINGLE STAGE PUMP

- HALE QMAX-200
- 2000 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 will be of a size and design to mount on the chassis rails of commercial and custom truck chassis, and have the capacity of 2000 gallons per minute (U.S. GPM), NFPA-1901 rated performance.

The entire pump will be manufactured and tested at the pump manufacturer's factory. The pump will be driven by a drive line from the truck transmission. The engine will provide sufficient horsepower and RPM to enable the pump to meet and exceed its rated performance. The entire pump, both suction and discharge passages, will be hydrostatically tested to a pressure of 600 PSI. The pump will be fully tested at the pump manufacturer's factory to performance specs as outlined by the latest NFPA-1901. Pump will be free from objectionable pulsation and vibration. The pump body and related parts will be of fine grain alloy cast iron with a minimum tensile strength of 30,000 PSI. All moving parts in contact with water will be of high quality bronze or

stainless steel. Pumps utilizing castings made of lower tensile strength cast iron are not acceptable. Pump body will 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 will 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 will 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 will have one double suction impeller. The pump body will have two opposed discharge volute cutwaters to eliminate radial unbalance. Pump impeller will be hard, fine grained bronze of the mixed flow design, accurately machined, and individually balanced. The vanes of the impeller intake eyes will be of sufficient size and design to provide ample reserve capacity utilizing minimum horsepower. Impeller clearance rings will be bronze, easily renewable without replacing impeller or pump volute body, and of wrap-around double labyrinth design for maximum efficiency.

HALE PACKING GLAND

The pump shaft will have only one (1) packing gland located on inlet side of the pump. It will be a split design for ease of repacking.

The packing gland must be a full circle threaded design to exert uniform pressure on packing and to prevent cocking and uneven packing load when it is tightened.

It will be easily adjusted by hand with rod or screwdriver with no special tools or wrenches required.

The packing rings will be of a unique permanently lubricated, long life graphite composition and have sacrificial zinc foil separators to protect the pump shaft from galvanic corrosion.

PUMP RATIO

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

The manufacturer will 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

Extra heavy duty pump mounting brackets will be furnished.

These will 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 will be the same on each end of the drive shaft.

This will assure full capacity performance with a minimum of vibration. Mounting hardware will utilize Grade 8 bolts.

HALE PUMP DRIVE UNIT

The drive unit will be completely assembled and tested at the pump manufacturer's factory.

Pump drive unit will be of sufficient size to withstand up to 16,000 lbs. ft. of torque of the engine in both road and pump operating conditions.

The drive unit will be designed of ample capacity for lubrication reserve and to maintain the proper operating temperature.

The gearbox drive shafts will 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 will withstand the full torque of the engine in both road and pump operating conditions. All gears, both drive and pump, will be of the highest quality electric furnace chrome nickel steel.

Bores will be ground to size and teeth integrated, chrome-shaven and hardened, to give an extremely accurate gear for long life, smooth, quiet running and higher load carrying capability.

An accurately cut spur design will be provided to eliminate all possible end thrust.

PUMP SHIFT MANUAL OVERRIDE

An emergency manual pump shift control will 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 will be furnished in the cab to ensure positive lock-up of the transmission.

HALE PUMP SHIFT INDICATOR LIGHTS

For automatic transmissions, three (3) green warning lights will be provided to indicate to the operator 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 will be provided for the driving compartment.

All lights to have appropriate identification/instruction plates.

HALE ANODE BLOCKS

Two (2) Hale Alloy Anode blocks will 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 will be painted Safety Yellow for identification purposes.

HALE THERMAL RELIEF VALVE

A Hale Model TRV120 Thermal Relief Valve will be provided on the pump.

If water temperature in the pump exceeds 120 degrees Fahrenheit, the thermal relief valve will automatically open and discharge pump water to the ground, through a 3/8" discharge line, routed below the pump module.

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

AUDIBLE ALARM FOR THERMAL RELIEF VALVE

An audible alarm will be provided on the operator's panel to alert the operator when the thermal relief valve is activated.

AUXILIARY ENGINE COOLER

An auxiliary cooler or heat exchanger will be installed in the engine compartment between the engine and the chassis radiator.

The cooler will permit the use of water from the pump for cooling the engine. The cooling will be done without mixing engine and pump water.

FIRE RESEARCH "IN CONTROL" TGA-400

The apparatus will be equipped with a Fire Research InControl series TGA400 pressure governor and monitoring display kit will be installed. The kit will include a control module, intake pressure sensor, discharge pressure sensor, and cables. The control module case will be waterproof and have dimensions not to exceed 5 1/2" high by 10 1/2" wide by 2" deep. The control knob will be 2" in diameter with no mechanical stops, have a serrated grip, and a red idle push button in the center. It will not extend more than 1 3/4" from the front of the control module. Inputs for monitored information will be from a J1939 databus or independent sensors. Outputs for engine control will be on the J1939 databus or engine specific wiring.

The following continuous displays will be provided:

- Pump discharge; shown with four daylight bright LED digits more than 1/2" high.
- Pump Intake; shown with four daylight bright LED digits more than 1/2" high.
- Pressure / RPM setting; shown on a dot matrix message display.

- Pressure and RPM operating mode LEDs.
- Throttle ready LED.
- 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.
- The dot-matrix message display will show diagnostic and warning messages as they occur. It will show monitored apparatus information, stored data, and program options when selected by the operator. All LED intensity will be automatically adjusted for day and nighttime operation.

The program will store the accumulated operating hours for the pump and engine to be displayed with the push of a button. It will 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 will be accessed via push buttons and a control knob located on the front of the control panel. There will be a USB port located at the rear of the control module to upload future firmware enhancements.

Inputs to the control panel from the pump discharge and intake pressure sensors will be electrical. The discharge pressure display will show pressures from 0 to 600 psi. The intake pressure display will show pressures from -30 in. Hg to 600 psi.

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

response and a push button to return the engine to idle. The pressure governor, monitoring, and master pressure display will be programmed to interface with a specific engine.

ELKHART STYLE #40 INTAKE RELIEF VALVE

An Elkhart Model 40 intake relief valve system will be plumbed on the suction side of the pump to comply fully with NFPA-1901 requirements.

It will have an adjustable pressure relief setting from 75 psi to 250 psi and is factory preset at 125 psi.

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

HALE OIL-LESS PRIMING SYSTEM

The priming pump will be a 12-volt Hale model ESP Oil-Less, positive displacement vane type primer, electrically driven.

One priming control will open the priming valve and start the priming motor. The primer will be capable of priming without the use of primer oil.

The primer will be connected to the power source with a 300 amp fusible link.

The Hale primer will be activated by a control located on the pump operator's panel.

The control will activate the primer motor, which will create a vacuum.

Valve actuation may be accomplished while the main pump is operational, if necessary to assure complete prime.

ROTARY MASTER DRAIN VALVE

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

The valve will 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 will be drained below the apparatus body and away from the pump operator.

DRAINS & BLEEDERS

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

One (1) individual "Innovative Control" lift up drain valve will be furnished for each 1-1/2" or larger discharge port and each 2-1/2" gated auxiliary suction.

Drain/bleeder valves will be located at the bottom of the side pump module panels. All drains and bleeders will discharge below the running boards.

SYNFLEX SUCTION, DISCHARGE, PRESSURE AND CONTROL LINES

Small lines within the pump enclosure will 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

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

A removable strainer will be installed on each inlet.

SHORT NECK MAIN PUMP SUCTION INLETS

The main pump suction inlets will 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

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

<u>6" NH - 5" STORZ ELKHART INTAKE VALVE #9786 – DRIVER SIDE INTAKE</u>

One (1) 6" NH x 5" Storz Elkhart Piston Intake Valve # 9786 and 5" storz cap will be provided for the driver side main suction inlet.

6" NH - 5" STORZ ELKHART INTAKE VALVE #9786 – OFFICER SIDE INTAKE

One (1) 6" NH x 5" Storz Elkhart Piston Intake Valve # 9786 and 5" storz cap will be provided for the officer side main suction inlet.

FRONT SUCTION 6" NST THREADS

A 6" NST front suction inlet will be provided at the front of the vehicle, plumbed from the pump.

SUCTION TO TERMINATE WITH 6'' CHROME 180° SWIVEL

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

<u>6'' NST MALE THREADS ON FRONT SUCTION</u>

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

FRONT SUCTION PLUMBING

The front inlet will be plumbed utilizing 5", 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 will be provided ahead of the front wheel and a panel controlled drain will be provided aft of the front wheel.

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

HALE MIV BUTTERFLY VALVE FOR FRONT SUCTION

The front suction plumbing will be fitted with a Hale Master Intake Valve (MIV), on the front suction inlet.

The valve will 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 will be manufactured of fine grained, corrosion resistant bronze.

The valve housing will incorporate a pressure relief valve, set at the pump manufacturers facility to a rating of 125 PSI.

The pressure relief valve will provide protection for the suction hose even with the valve in the closed position.

The valve will incorporate NFPA compliance, large diameter hose air bleed valve, controlled at the operator's panel.

HALE MIV ELECTRIC VALVE - FRONT SUCTION CONNECTION

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

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

The electric control will incorporate a placard with status lights to indicate whether the valve is in the closed, open or throttled position.

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

6" NST FRONT SUCTION PRESSURE VENTED CAP

A 6", NST chrome plated long handle vented cap will be installed on front suction.

PUSH/PULL CONTROL – DRIVER SIDE FRONT AUXILIARY SUCTION

A locking 1/4 turn swing control handle will be provided on the top mount control panel for the driver side front auxiliary suction valve.

DRIVER SIDE AUXILIARY PRIMARY SUCTION INLET

One (1) 2-1/2" auxiliary suction will be provided at the driver side pump panel, to the front of the main inlet.

The 2-1/2" auxiliary suction will terminate with a removable strainer, chrome plated 2-1/2" NST female swivel with a chrome plated plug and retaining chain.

2-1/2" ELKHART VALVE – DRIVER SIDE FRONT AUXILIARY SUCTION

An EB25, 2 1/2" Elkhart Unibody valve, will be provided for the driver side front auxiliary suction.

SWING CONTROL VALVE - DRIVER SIDE REAR AUXILIARY SUCTION

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

OFFICER SIDE AUXILIARY PRIMARY SUCTION INLET

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

The 2-1/2" auxiliary suction will terminate with a removable strainer, chrome plated 2-1/2" NST female swivel with a chrome plated plug and retaining chain.

ELKHART VALVE – OFFICER SIDE FRONT AUXILIARY SUCTION

An EB25, 2 1/2" Elkhart Unibody valve, will be provided for the right side front auxiliary suction.

TANK TO PUMP

One (1) 4" tank to pump line will be piped through the front bulkhead of the tank with a 90 degree elbow down into the tank sump.

This line will be plumbed directly into the rear of the pump suction manifold for maximum efficiency.

A check valve will be provided to prevent accidental pressurization of the water tank through the pump connection.

Connection from the valve to the tank will be made by using a non-collapsible flexible rubber hose.

<u>3'' ELKHART VALVE FOR TANK TO PUMP</u>

An EB30, 3" Elkhart Unibody valve, will be provided between the pump suction manifold and the water tank.

<u>3" TOP MOUNT SWING CONTROL FOR TANK TO PUMP</u>

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

TANK FILL LINE

One (1) 2" gated full flow pump to tank refill line controlled at the pump panel will be provided. A deflector shield inside the tank will be furnished. Tank fill plumbing will utilize 2" high pressure hose for tank connection to accommodate flexing between components.

ELKHART VALVE FOR TANK FILL

An EB20, 2" Elkhart Unibody valve, will be provided between the pump discharge manifold and the water tank.

TOP MOUNT SWING CONTROL FOR TANK FILL

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

DRIVER SIDE DISCHARGE #1

A discharge will be provided and located at the driver's side pump panel.

The driver's side discharges # 1 will terminate with NST threads, through the left panel above the main pump intake.

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

ELKHART 2-1/2" VALVE FOR DRIVER SIDE DISCHARGE #1

An EB25, 2 1/2" Elkhart Unibody valve, will be provided for the driver's side # 1 discharge.

2-1/2" STRAIGHT NST & 30-DEGREE NST – DRIVER SIDE DISCHARGE #1

The discharge valve will be equipped with a straight 2 1/2" NST adapter that will be equipped with a 2 1/2" NST, 30-degree, chrome plated elbow.

2-1/2" NST PRESSURE VENTED CAP – DRIVER SIDE DISCHARGE #1

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

TOP MOUNT SWING CONTROL HANDLE – DRIVER SIDE DISCHARGE #1

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

INNOVATIVE CONTROLS LIQUID FILLED 2-1/2'' PRESSURE GAUGE

The driver's side # 1 discharge will be equipped with a 2.5" Innovative Controls pressure gauge.

The gauge will have a rugged, corrosion free stainless steel case and clear scratch resistant molded crystals with captive, O-ring seals to ensure distortion free viewing and seal the gauge.

The gauge will be filled with glycerin to dampen shock and vibration, lubricate the internal mechanisms, prevent lens condensation and ensure proper operation from -40F to +160F.

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

A polished chrome-plated stainless steel bezel will be provided to prevent corrosion and protect the lens and gauge case.

The gauge will have black graphics on a white background.

DRIVER SIDE DISCHARGE #2

A discharge will be provided and located at the driver's side pump panel.

The driver's side discharges # 2 will terminate with NST threads, through the left panel above the main pump intake.

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

ELKHART 2-1/2" VALVE FOR DRIVER SIDE DISCHARGE #2

An EB25, 2 1/2" Elkhart Unibody valve, will be provided for the driver's side # 2 discharge.

2-1/2" STRAIGHT NST & 30-DEGREE NST – DRIVER SIDE DISCHARGE #2

The discharge valve will be equipped with a straight 2 1/2" NST adapter that will be equipped with a 2 1/2" NST, 30-degree, chrome plated elbow.

2-1/2" NST PRESSURE VENTED CAP – DRIVER SIDE DISCHARGE #2

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

TOP MOUNT SWING CONTROL HANDLE – DRIVER SIDE DISCHARGE #2

The driver's side # 2 discharge valve will be controlled by a locking push/pull swing handle located on the top mount operator's panel.

INNOVATIVE CONTROLS LIQUID FILLED 2-1/2'' PRESSURE GAUGE

The driver's side # 2 discharge will be equipped with a 2.5", Innovative Controls pressure gauge.

The gauge will have a rugged, corrosion free, stainless steel case and clear, scratch resistant, molded crystals with captive, O-ring seals to ensure distortion free viewing and seal the gauge.

The gauge will be filled with glycerin to dampen shock and vibration, lubricate the internal mechanisms, prevent lens condensation, and ensure proper operation from -40F to +160F.

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

A polished, chrome-plated, stainless steel bezel will be provided to prevent corrosion and protect the lens and gauge case.

The gauge will have black graphics on a white background.

OFFICER SIDE DISCHARGE #1

A discharge will be provided and located at the officer's side pump panel.

The officer's side discharges #1 will terminate with NST threads, through the officer's side panel above the main pump intake.

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

ELKHART 2-1/2" VALVE FOR OFFICER SIDE DISCHARGE #1

An EB25, 2 1/2" Elkhart Unibody valve, will be provided for the officer's side # 1 discharge.

2-1/2" STRAIGHT NST & 30-DEGREE NST – OFFICER SIDE DISCHARGE #1

The discharge valve will be equipped with a straight, 2 1/2" NST adapter that will be equipped with a 2 1/2" NST, 30-degree, chrome plated elbow.

2-1/2" NST PRESSURE VENTED CAP – OFFICER SIDE DISCHARGE #1

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

TOP MOUNT SWING CONTROL HANDLE – OFFICER SIDE DISCHARGE #1

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

INNOVATIVE CONTROLS LIQUID FILLED 2-1/2" PRESSURE GAUGE

The officer's side, # 1 discharge will be equipped with a 2.5", Innovative Controls pressure gauge.

The gauge will have a rugged, corrosion free, stainless steel case and clear, scratch resistant, molded crystals with captive, O-ring seals to ensure distortion free viewing and seal the gauge.

The gauge will be filled with glycerin to dampen shock and vibration, lubricate the internal mechanisms, prevent lens condensation and ensure proper operation from -40F to +160F.

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

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

OFFICER SIDE DISCHARGE #2

A discharge will be provided and located at the officer's side pump panel.

The officer's side discharges #2 will terminate with NST threads, through the officer's side panel above the main pump intake.

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

ELKHART 2-1/2" VALVE FOR OFFICER SIDE DISCHARGE #2

An EB25, 2 1/2" Elkhart Unibody valve will be provided for the officer's side #2 discharge.

2-1/2" STRAIGHT NST & 30-DEGREE NST – OFFICER SIDE DISCHARGE #2

The discharge valve will be equipped with a straight, 2 1/2" NST, adapter that will be equipped with a 2 1/2" NST, 30-degree, chrome plated elbow.

TOP MOUNT SWING CONTROL HANDLE – OFFICER SIDE DISCHARGE #2

The officer's side, #2 discharge valve will be controlled by a locking push/pull swing handle located on the top mount, operator's panel.

INNOVATIVE CONTROLS LIQUID FILLED 2-1/2" PRESSURE GAUGE

The officer's side, #2 discharge will be equipped with a 2.5", Innovative Controls, pressure gauge.

The gauge will have a rugged, corrosion free, stainless steel case and clear, scratch resistant, molded crystals with captive, O-ring seals to ensure distortion free viewing and seal the gauge. The gauge will be filled with glycerin to dampen shock and vibration, lubricate the internal mechanisms, prevent lens condensation, and ensure proper operation from -40F to +160F.

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

A polished, chrome-plated, stainless steel bezel will be provided to prevent corrosion and protect the lens and gauge case.

The gauge will have black graphics on a white background.

DRIVER SIDE REAR DISCHARGE

A 3" NST rear discharge will be provided at the rear of the vehicle, plumbed from the pump.

TOP MOUNT DRIVER SIDE REAR DISCHARGE #1 – SWING HANDLE CONTROL

DRIVER SIDE REAR DISCHARGE THROUGH TANK SLEEVE

The rear discharge will be plumbed through a pipe sleeve integrated into the water tank that will terminate on the rear body panel, on the driver side of the body.

3" NST MALE THREADS ON DRIVER SIDE REAR DISCHARGE

The driver side rear discharge pipe will be furnished with 3" NSTM threads. The discharge will be equipped with a 30 degree droop terminating in 3" NSTM threads.

DRIVER SIDE REAR DISCHARGE PLUMBING

The driver side, rear discharge will 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 rear of the vehicle.

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

ELKHART 3" VALVE FOR DRIVER SIDE REAR DISCHARGE

An EB40, 4" Elkhart Unibody valve will be provided for the driver side, rear discharge.

ELKHART HANDWHEEL GEAR VALVE CONTROL, DRIVER SIDE REAR DISCHARGE

The driver side rear discharge will be gated with an Elkhart Hand wheel controlled, inline valve.

The valve will be controlled at the pump operator's panel with a chrome plated hand wheel with a built in valve position indicator.

3" NST X 5" STORZ KOCHEK S37S ADAPTER WITH CAP

A 3" NST x 5" STORZ Kochek S37S adapter and cap will be provided for the driver side rear discharge.

INNOVATIVE CONTROLS LIQUID FILLED 2-1/2" PRESSURE GAUGE

The driver side rear discharge will be equipped with a 2.5" Innovative Controls pressure gauge.

The gauge will have a rugged corrosion free stainless steel case and clear scratch resistant molded crystals with captive O-ring seals to ensure distortion free viewing and seal the gauge.

The gauge will be filled with glycerin to dampen shock and vibration, lubricate the internal mechanisms, prevent lens condensation and ensure proper operation from -40F to +160F.

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

A polished chrome-plated stainless steel bezel will be provided to prevent corrosion and protect the lens and gauge case.

The gauge will have black graphics on a white background.

DECK GUN DISCHARGE

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

DECK GUN DISCHARGE TERMINATION

The deck gun discharge will be located in the center of the dunnage area above the pump module.

A pedestal type, 1/4" steel plate support assembly will be provided to stabilize deck gun plumbing below deck gun mount flange.

TOP MOUNT DISCHARGES - SWING HANDLE CONTROLS

All top mount valves will be controlled by a locking push/pull swing handle unless otherwise noted in the individual discharge below.

4-BOLT FLANGE ON DECK GUN DISCHARGE

The deck gun discharge pipe will terminate with a 4-bolt flange.

DECK GUN DISCHARGE

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

The deck gun discharge will 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 will be furnished in this assembly to allow for flex and serviceability.

ELKHART 3" VALVE FOR DECK GUN DISCHARGE

An EB30, 3" Elkhart Unibody valve will be provided for the deck gun discharge.

PUSH/PULL CONTROL FOR DECK GUN DISCHARGE

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

INNOVATIVE CONTROLS LIQUID FILLED 2-1/2" PRESSURE GAUGE

The deck gun discharge will be equipped with a 2.5" diameter Innovative Controls pressure gauge.

The gauge will have a rugged corrosion free stainless steel case and clear scratch resistant molded crystals with captive O-ring seals to ensure distortion free viewing and seal the gauge.

The gauge will be filled with glycerin to dampen shock and vibration, lubricate the internal mechanisms, prevent lens condensation and ensure proper operation from -40F to +160F.

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

A polished chrome-plated stainless steel bezel will be provided to prevent corrosion and protect the lens and gauge case.

The gauge will have black graphics on a white background.

TFT "HURRICANE" MANUAL DECK GUN

A TFT Hurricane monitor will be supplied and mounted on the deck gun discharge of the unit to provide the maximum travel clearance.

TFT QUAD STACKED TIPS AND STREAM STRAIGHTENER

A set of TFT stacked tips and stream straightener will be provided with the monitor.

TOP MOUNT FRONT DISCHARGE 1 - SWING HANDLE CONTROL

A 1/4 turn swing control handle will be provided on the driver side front discharge #1 valve.

TOP MOUNT CROSSLAY 1 DISCHARGE - SWING HANDLE CONTROL

CROSSLAY #1

A crosslay hose bed will 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 will be designed to be removable and constructed from brushed finish, perforated aluminum material.

CROSSLAY #1 CAPACITY

Crosslay #1 will be designed to have a minimum total capacity of 3.5 cubic feet as required by NFPA -1901 to accommodate a minimum of 200 feet of $2 \frac{1}{2}$ " fire hose.

CROSSLAY #1 DESIGN

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

2-1/2" NST CHICKSAN SWIVEL - CROSSLAY #1

The crosslay discharge will terminate below the hosebed floor with a 2 1/2" NSTM chicksan swivel adapter.

The crosslay hose bed floor will 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

The crosslay #1 discharge will be plumbed utilizing $2\frac{1}{2}$ " 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 will be furnished in this assembly, if necessary, to allow for flex and serviceability.

ELKHART 2" VALVE FOR CROSSLAY #1

An EB25, 2 ¹/₂" Elkhart Unibody valve, will be provided for the crosslay #1 discharge.

PUSH/PULL CONTROL CROSSLAY #1

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

INNOVATIVE CONTROLS LIQUID FILLED 2-1/2" PRESSURE GAUGE

The crosslay #1 discharge will be equipped with a 2.5" Innovative Controls pressure gauge.

The gauge will have a rugged corrosion free stainless steel case and clear scratch resistant molded crystals with captive O-ring seals to ensure distortion free viewing and seal the gauge.

The gauge will be filled with glycerin to dampen shock and vibration, lubricate the internal mechanisms, prevent lens condensation and ensure proper operation from -40F to +160F. The gauge will exceed ANSI B40.1 Grade A requirements with an accuracy of $\pm -1.5\%$ full scale and include a size appropriate phosphorous bronze bourdon tube with a reinforced lap joint and large tube base to increase the tube life and gauge accuracy.

A polished chrome-plated stainless steel bezel will be provided to prevent corrosion and protect the lens and gauge case.

The gauge will have black graphics on a white background.

SPEEDLAY #1

Speedlay #1 will be a transverse hose bed, which will be designed as an integral part of the pump module design, located forward of the pump just above the frame rails.

Hose deployment will be accomplished from either side of the apparatus.

The speedlay hose bed flooring will be designed to be removable, constructed from brushed finish, perforated aluminum material.

SLIDE-OUT TRAY FOR SPEEDLAY #1

A 3/16" aluminum three (3) sided "J" shaped slide out tray will be provided for speedlay #1 to allow easy loading of the hose off the vehicle. The tray will be designed to slide out from either side of the vehicle. The sides and floor of the opening will be lined with Nylatron to assist in the loading of the tray. The tray will have a cut out on each side, so it may be used as a handle to remove. The handle area will extend passed the side panel on each end, allowing removal without getting one's fingers caught in the latch tray mechanism. A cadmium plated thumb type latches will be provided for the tray to secure in the speedlay opening.

STAINLESS STEEL SCUFF PLATES - SPEEDLAY #1

The outer edge of the speedlay #1 hosebed will be trimmed stainless steel scuff plates.

1-1/2" NST CHICKSAN SWIVEL - SPEEDLAY #1

The speedlay #1 discharge will terminate through the rear wall of the hosebed with a 1 1/2" NSTM chicksan swivel adapter.

The hosebed rear wall will be slotted to allow the swivel to through the wall, allowing the preconnected hose to be pulled off either side of the apparatus without kinking the hose at the coupling connection.

TOP MOUNT SPEEDLAY #1 DISCHARGE - SWING HANDLE CONTROL

The Speedlay # 1 discharge will be controlled at the top mount control panel with a locking swing handle.

SPEEDLAY #1 CAPACITY

Speedlay #1 will be designed to have a minimum total capacity of 3.5 cubic feet as required by NFPA -1901 to accommodate a minimum of 200 feet of 1-3/4" fire hose.

The hose will be loaded in a double stack configuration.

SPEEDLAY #1 PLUMBING

The speedlay #1 discharge will 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 speedlay hosebed.

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

ELKHART 2" VALVE FOR SPEEDLAY #1

An EB20, 2" Elkhart Unibody valve, will be provided for the speedlay #1 discharge.

PUSH/PULL CONTROL - SPEEDLAY #1

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

INNOVATIVE CONTROLS LIQUID FILLED 2-1/2" PRESSURE GAUGE

The speedlay #1 discharge will be equipped with a 2.5" Innovative Controls pressure gauge.

The gauge will have a rugged corrosion free stainless steel case and clear scratch resistant molded crystals with captive O-ring seals to ensure distortion free viewing and seal the gauge.

The gauge will be filled with glycerin to dampen shock and vibration, lubricate the internal mechanisms, prevent lens condensation and ensure proper operation from -40F to +160F.

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

A polished chrome-plated stainless steel bezel will be provided to prevent corrosion and protect the lens and gauge case.

The gauge will have black graphics on a white background.

SPEEDLAY #2

Speedlay #2 will be a transverse hose bed, which will be designed as an integral part of the pump module design, located forward of the pump just above the lower speedlay.

Hose deployment will be accomplished from either side of the apparatus.

The speedlay hose bed flooring will be designed to be removable, constructed from brushed finish, perforated aluminum material.

SLIDE-OUT TRAY FOR SPEEDLAY #2

A 3/16" aluminum three (3) sided "J" shaped slide out tray will be provided for speedlay #2 to allow easy loading of the hose from the vehicle. The tray will be designed to slide out from either side of the vehicle. The sides and floor of the opening will be lined with Nylatron to assist in the loading of the tray. The tray will have a cut out on each side so it may be used as a handle to remove. The handle area will extend passed the side panel on each end, allowing removal without getting one's fingers caught in the latch tray mechanism. A cadmium plated thumb type latches will be provided for the tray to secure in the speedlay opening.

STAINLESS STEEL SCUFF PLATES - SPEEDLAY #2

The outer edge of the speedlay #2 hosebed will be trimmed stainless steel scuff plates.

1-1/2" NST CHICKSAN SWIVEL - SPEEDLAY #2

The speedlay #2 discharge will terminate through the rear wall of the hosebed with a 1 1/2" NSTM chicksan swivel adapter.

The hosebed rear wall will be slotted to allow the swivel to through the wall, allowing the preconnected hose to be pulled off either side of the apparatus without kinking the hose at the coupling connection.

TOP MOUNT SPEEDLAY 2 DISCHARGE - SWING HANDLE CONTROL

The Speedlay # 2 discharge will be controlled at the top mount control panel with a locking swing handle.

SPEEDLAY #2 CAPACITY

Speedlay #2 will be designed to have a minimum total capacity of 3.5 cubic feet as required by NFPA -1901 to accommodate a minimum of 200 feet of 1-3/4" fire hose.

The hose will be loaded in a double stack configuration.

SPEEDLAY #2 PLUMBING

The speedlay #2 discharge will 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 speedlay hosebed.

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

ELKHART 2" VALVE FOR SPEEDLAY #2

An EB20, 2" Elkhart Unibody valve, will be provided for the speedlay #2 discharge.

PUSH/PULL CONTROL - SPEEDLAY #2

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

INNOVATIVE CONTROLS LIQUID FILLED 2-1/2" PRESSURE GAUGE

The speedlay #2 discharge will be equipped with a 2.5" Innovative Controls pressure gauge.

The gauge will have a rugged corrosion free stainless steel case and clear scratch resistant molded crystals with captive O-ring seals to ensure distortion free viewing and seal the gauge.

The gauge will be filled with glycerin to dampen shock and vibration, lubricate the internal mechanisms, prevent lens condensation and ensure proper operation from -40F to +160F.

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

A polished chrome-plated stainless steel bezel will be provided to prevent corrosion and protect the lens and gauge case.

The gauge will have black graphics on a white background.

VINYL END FLAPS FOR ALUMINUM TREADPLATE CROSSLAY COVER

Vinyl flaps will 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.

END FLAP COVER RED IN COLOR

The crosslay end flap will be red in color.

VINYL END FLAPS FOR SPEEDLAYS

Vinyl coated polyester covers will be provided on each side of the speed lays to retain hose in the speed lays.

The covers will be secured with expandable loops sewn into the covers and hooks on the apparatus.

SPEEDLAY FLAP RED IN COLOR

The speed lay end flap will be red in color.

FRONT HINGED CROSSLAY HOSE BED COVER

A 3/16" polished aluminum tread plate cross lay cover will be provided with a full length stainless steel hinge at the front of the cover.

BOOSTER REEL #1

BOOSTER REEL DISCHARGE #1

A 1 1/2" booster reel discharge will be plumbed from the pump to the booster reel.

BOOSTER REEL DISCHARGE #1 PLUMBING

The booster reel discharge will be plumbed from the valve to the hose reel utilizing 1" high pressure hose. The end of the hose connected to the hose reel will be equipped with a swivel end for ease in hose replacement.

ELKHART 1-1/2" VALVE FORBOOSTER REEL #1

An EB15, 1 1/2" Elkhart Unibody valve, will be provided for the booster reel #1 discharge.

PUSH/PULL CONTROL FOR BOOSTER REEL #1

The booster reel discharge valve will be controlled by a push/pull handle located on the operator's panel.

INNOVATIVE CONTROLS LIQUID FILLED 2-1/2" PRESSURE GAUGE

The booster reel discharge will be equipped with a 2.5" Innovative Controls pressure gauge.

The gauge will have a rugged corrosion free stainless steel case and clear scratch resistant molded crystals with captive O-ring seals to ensure distortion free viewing and seal the gauge.

The gauge will be filled with glycerin to dampen shock and vibration, lubricate the internal mechanisms, prevent lens condensation and ensure proper operation from -40F to +160F.

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

A polished chrome-plated stainless steel bezel will be provided to prevent corrosion and protect the lens and gauge case.

The gauge will have black graphics on a white background.

BOOSTER REEL DISCHARGE #1 - PAINTED STEEL

One (1) painted steel electric rewind booster reel will be furnished.

The reel will be equipped with a one(1) inch 90 full flow swivel joint and an adjustable brake for freewheeling, drag or full lock operation.

Color will be graphite.

BOOSTER REEL DISCHARGE #1 REEL - MOUNTED IN REAR STEP COMPARTMENT

The booster reel #1 will be mounted in the rear step compartment.

HOSE REEL DISCHARGE #1 REWIND MOUNTED NEAR REEL

Booster reel rewind will be controlled by a push button near the reel.

The booster reel circuit will be equipped with a shielded toggle switch to act as a booster reel disconnect to avoid accidental actuation of the booster reel rewind button.

BOOSTER REEL #1 HOSE

Each booster reel will be equipped with 200' of 3/4" booster hose in 100' sections. Each length will be fitted with NST couplings.

TWO (2) BOOSTER REEL HOSE ROLLERS

Two (2) horizontal hose rollers of polished stainless steel and guide spools will be placed one (1) on each side panel.

PUMP INSTALLATION

TOP MOUNT PUMP MODULE

The pump module will 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 will be securely mounted to the chassis frame rails.

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

The valves will be controlled by vertically operated swing handles. Each handle will be equipped with a twist-lock, easy-grip knob.

The valve control handles will be mounted in-line.

Each valve control handle will be connected to its respective valve via a control rod and a bell crank mechanism, if needed.

Each control rod will consist of a 1/2" pipe welded to a threaded stud to form a rigid linkage. Each pressure gauge will be located directly above its respective discharge control handle, and will be clearly marked by color coded name plates.

PUMP MODULE MATERIAL

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

TOP MOUNT DUNNAGE AREA

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

PUMP MODULE WALKWAY

There will be a transverse walkway located at the rear of the chassis cab, ahead of the pump module.

The walkway will be constructed of 3/16" aluminum tread plate and will be clear and unobstructed for through traffic.

Folding steps will be provided if necessary to maintain NFPA step heights.

If steps adjacent to walkway (such as commercial chassis cab access steps provide NFPA compliant step height, folding steps will not be provided.

A miscellaneous equipment storage compartment will be provided at either side of the walkway, outboard of the chassis frame rails.

A vertically hinged, aluminum tread plate door with positive closure latch will be provided on the outboard face of each compartment.

Compartments will be ventilated.

PUMPHOUSE WALKWAY ACCESS

A folding step will be provided on the exterior rear wall of the cab, on the driver and officer side, to provide easy access to the pump house walkway.

The steps will mount approximately 13" from the bottom of the rear cab sheet and centered 6" from the outer edge of the cab.

The step will match the folding steps utilized on the apparatus body.

WALKWAY WIDTH

The pump house walkway will be approximately 22" wide.

RUNNING BOARD STEPS

The driver and officer running board steps will be fabricated of 3/16" polished aluminum tread plate.

The outside edge on each step will be fabricated with a double break, return flange.

The steps will be rigidly reinforced with a heavy duty support structure.

The running boards will not form any part of the compartment design, and will be bolted into place with a minimum 1/2" clearance gap between any panel to facilitate water runoff.

STORAGE WELL IN OFFICERS SIDE RUNNING BOARD

A floating storage well, constructed of 1/8" aluminum, will be recessed into the officer's side running board.

The storage well will measure 9" deep x 9" wide x as long as possible between the running board support members.

Drain holes will be located in the bottom corners to allow water to drain from the storage well.

The front and rear bottom corners of the well will have an angled face to help the well slide up if it strikes an object.

The entire well will be a "floating" style that can easily shift up if an object is struck.

TWO (2) VELCRO STRAPS ON OFFICER'S SIDE STORAGE WELL

The officer's side running board hose well will be furnished with Velcro straps to secure the hose stored in the well.

The straps will be attached to each side of the hose well with stainless steel footman loops.

OFFICER'S SIDE WELL - HOSE CAPACITY

The officer's side storage well will have the desired capacity of 150' of 1 3/4" hose

STORAGE WELL IN DRIVERS SIDE RUNNING BOARD

A floating storage well, constructed of 1/8" aluminum, will be recessed into the driver's side running board.

The storage well will measure 9" deep x 9" wide x as long as possible between the running board support members.

Drain holes will be located in the bottom corners to allow water to drain from the storage well.

The front and rear bottom corners of the well will have an angled face to help the well slide up if it strikes an object.

The entire well will be a "floating" style that can easily shift up if an object is struck.

TWO (2) VELCRO STRAPS ON DRIVER'S SIDE STORAGE WELL

The driver's side running board hose well will be furnished with Velcro straps to secure the hose stored in the well.

The straps will be attached to each side of the hose well with stainless steel footman loops.

DRIVER'S SIDE WELL - HOSE CAPACITY

The driver's side storage well will have the desired capacity of 150' of 1 3/4" hose.

TOP MOUNT PUMP PANEL

The pump operator's control panel will be located above the pump towards the rear of the transverse walkway area with the operator facing the rear of the apparatus to operate the pump controls. The top and side panels will be completely removable and designed for easy access and servicing.

TOP MOUNT GAUGE PANEL

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

TOP MOUNT SIDE PANELS

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

HORIZONTALLY HINGED GAUGE PANEL - TOP MOUNT

An angled, full width, horizontally hinged gauge access panel will be provided at the top mount operator's position. Chrome plated positive locks will be provided along with chain holders to secure the panel in the opened position.

DRIVER'S SIDE VERTICALLY HINGED PUMP ACCESS DOOR

The driver side pump panel will be split and vertically hinged to provide complete access to the pump and plumbing on the driver side of the pump enclosure.

The panels will be equipped with stainless steel hinges and secured with push type locks to hold the panels closed.

The drains located on the driver side panel will be fastened to the lower panel, which will be stationary.

OFFICER'S SIDE VERTICALLY HINGED PUMP ACCESS DOOR

The officer's side pump panel will 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 will 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 will be fastened to the lower panel, which will be stationary.

PANEL FASTENERS

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

CAPS AND ADAPTERS SAFETY TETHER

All applicable discharge and suction caps, plugs and adapters will be equipped with chrome plated ball chain and secured to the vehicle.

PUMP PANEL DISCHARGE / SUCTION TRIM PLATES

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

DISCHARGE GAUGE TRIM BEZELS

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

IDENTIFICATION PLATES

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

PUMP OPERATOR'S PANEL LIGHT SHIELD

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

The light shield will be equipped with the following lights:

• Three (3) 20" Amdor Luma Bar H2O super bright led strip lights.

One (1) light under the operator's panel light shield will be actuated when fire pump is engaged in addition to the pump engaged light.

TECNIQ EON 3 LED LIGHTS – DRIVER SIDE TOP MOUNT

• Four (4) TecNiq Eon, 3-LED illumination lights mounted in horizontal stainless steel bezels and mounting gaskets.

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

STEP LIGHTS FOR WALKWAY AREA - TOP MOUNT

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

• Four (4) TecNiq Eon, 3-LED illumination lights mounted in horizontal stainless steel bezels and mounting gaskets.

The lights will be controlled with the marker lights.

TECNIQ EON 3 LED LIGHTS – OFFICER SIDE TOP MOUNT

• Four (4) TecNiq Eon, 3-LED illumination lights mounted in horizontal stainless steel bezels and mounting gaskets.

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

3/4" PUMP BY-PASS COOLER ON PUMP PANEL

3/4" Pump cooler (Bypass Line).

PUMP PRESSURE & VACUUM TEST PORTS

The pump panel will be equipped with Vacuum Pressure test plugs to allow for test equipment to monitor pump pressure and vacuum levels.

Chrome plugs and labels will be provided for the test ports.

4" INNOVATIVE CONTROLS MASTER PRESSURE AND COMPOUND GAUGES

One (1) 4" diameter pressure gauge (labeled: "PRESSURE") and one (1) 4" diameter compound vacuum gauge (labeled: "INTAKE") will be provided.

The master gauges will be Innovative Controls glycerin filled. The gauge faces will be white with black numerals.

PRESSURE & COMPOUND GAUGE RANGES - SINGLE STAGE

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

PUMP CERTIFICATION - 750 GPM & UP

The pump will be third party performance tested to meet the requirements of NFPA-1901.

WATER TANK CAPACITY

The water tank will have a capacity of 1000 gallons, constructed from Poly material.

WATER TANK CONSTRUCTION POLY

The Poly water tank will be constructed of PT3 polypropylene material.

This material will be a non-corrosive stress relieved thermoplastic and UV stabilized for maximum protection.

Tank shell thickness may vary depending on the application and may range from 1/2 to 1" as required. Internal baffles are generally 3/8" in thickness.

The tank will be of a specific configuration and is so designed to be completely independent of the body and compartments.

Joints and seams will be fused using nitrogen gas as required and tested for maximum strength and integrity. The tank construction will include PolyProSeal technology wherein a sealant will be installed between the plastic components prior to being fusion welded.

This sealing method will provide a liquid barrier offering leak protection in the event of a weld compromise. The top of the booster tank is fitted with removable lifting assembly designed to facilitate tank removal.

The transverse and longitudinal swash partitions will be manufactured of a minimum of 3/8" PT3 polypropylene. All partitions will be equipped with vent and air holes to permit movement of air and water between compartments.

The partitions will be designed to provide maximum water flow. All swash partitions interlock with one another and are completely fused to each other as well as to the walls of the tank.

All partitions and spacing will comply with NFPA 1901.

The walls will be welded to the floor of the tank providing maximum strength as part of the tank's unique Full Floor Design. Tolerances in design allow for a maximum variation of 1/8" on all dimensions.

All tanks will be tested and certified as to capacity on a calibrated and certified tilting scale. Each tank will be weighed empty and full to provide precise fluid capacity. Each Poly-Tank's III is delivered with a Certificate of Capacity delineating the weight empty and full and the resultant capacity based on weight.

A tag will be installed on the apparatus in a convenient location and contain pertinent information including a QR code readable by commercially available smart phones. The information contained on the tag will include the capacity of the water and foam, the maximum fill and pressure rates, the serial number of the tank, the date of manufacture, the tank manufacturer, and contact information.

The QR code will allow the user to connect with the tank manufacturer for additional information and assistance. The tank must be designed and fabricated by a tank manufacturer that is ISO 9001:2000 certified in each of its locations. The ISO certification must be to the current standard in effect at the time of the design and fabrication of the tank.

WATER TANK LID

The tank cover will be constructed of 1/2" thick PT3 polypropylene and UV stabilized, to incorporate a multi-piece locking design, which allows for individual removal and inspection if necessary.

The tank cover will be flush or recessed 3/8" from the top of the tank and will be fused to the tank walls and longitudinal partitions for maximum integrity.

Each one of the covers will have hold downs consisting of 2" minimum polypropylene dowels spaced a maximum of 40" apart.

These dowels will extend through the covers and will assist in keeping the covers rigid under fast filling conditions.

A minimum of two lifting dowers will accommodate the necessary lifting hardware.

FILL TOWER

The tank will have a combination vent and manual fill tower.

The fill tower will be constructed of 1/2" PT3 polypropylene and will be a minimum dimension of $12" \ge 12"$ outer perimeter.

The fill tower will be blue in color indicating that it is a water-only fill tower.

The tower will be located in the left front corner of the tank unless otherwise specified by the tank manufacturer to the purchaser.

The tower will have a 1/4" thick removable polypropylene screen and a PT3 polypropylene hinged cover.

The capacity of the tank will be engraved on the top of the fill tower lid. Inside the fill tower there will be a combination vent/overflow pipe.

The vent overflow will be a minimum of schedule 40 polypropylene pipe with a minimum I.D. of that is designed to run through the tank, and will 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 OVERFLOW / VENT PIPE

The fill tower will 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 SUMP

The tank sump will be a minimum of 10" wide x 10" long x 3" deep.

An anti-swirl plate will be mounted inside the sump, approximately 1" above the bottom of the sump.

WATER TANK SUMP CONNECTIONS

The front bulkhead of the water tank will be fitted with one (1) tank sump connection.

WATER TANK DRAIN PLUG

A 4" drain plug will be provided.

WATER TANK FLANGES / OUTLETS

There will be two (2) standard tank outlets; one for tank-to-pump suction line which will be a minimum of 4" coupling and one for a tank fill line which will be a minimum of a 2" NPT coupling.

All tank fill couplings will be backed with flow deflectors to break up the stream of water entering the tank.

WATER TANK MOUNTING ALL "T" TANKS

The tank will rest on the body cross members spaced a maximum of 22" apart, and will be insulated from these cross members with a minimum of 3/16" nylon webbing or 1/2" rubber, 2-1/2" wide. The tank will sit cradle-mounted using four (4) corner angles of 6 x 6 x 4 x 0.250 welded directly to the body cross members.

The angles will keep the tank from shifting left to right or front to rear. The tank is designed on the free-floating suspension principle and will not require the use of hold downs.

The tank will be completely removable without disturbing or dismantling the apparatus body structure. The body or hose bed cross braces will act as water tank retainers.

WATER TANK LEVEL GAUGE

A Fire Research, model #WLA300-A00, "TANKVISION" gauge that shows the actual volume of water in the tank will be provided on the pump operator's panel. The "TANKVISION" gauge is designed for both ease of operation and installation. The "TANKVISION" gauge utilizes ultrabright 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 will 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 – REAR OF BODY

An additional Fire Research, model #WLA300-B00, "TANKVISION" gauge that shows the actual volume of water in the tank will be provided on the rear of the vehicle. 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 will be equipped with a self-calibration feature that allows the 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 the poly tank.
- Special fittings available for other tank materials.
- Connector disconnects at the back of the display.

WATER TANK LEVEL GAUGE

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

WATER TANK LEVEL GAUGE

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

CAB WATER TANK LEVEL GAUGE

A large light water level gauge system will be provided on both sides of the cab. Each side will have a Whelen model PSTANK2, LED strip light, surface mounted, behind the rear crew door above the handrail.

The strip light will indicate the following water levels:

- Green LED cluster Full tank
- Blue LED cluster 3/4 tank
- Amber LED cluster 1/2 tank
- Red LED cluster 1/4 tank

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

APPARATUS BODY DESCRIPTION

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

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

The body will be completely isolated from the cab and pump module structure.

SUPER STRUCTURE FOR ALUMINUM BODIES

The body super structure will be an all welded configuration utilizing a combination of 3" x 1-1/2" 6061-T6 thick walled structural tubing and 6061 structural channel.

This structure will be designed to totally support the full length and width of the body and will be welded to the body side compartments by use of reinforcement plates to incorporate the compartments into an integral part of the body weldment.
The super structure will be bolted to the sides of the chassis frame at four (4) points.

STEPPING, STANDING, WALKING SURFACES

All stepping, standing, and walking surfaces on the body will meet NFPA #1901 anti-slip standards. Aluminum tread plate utilized for stepping, standing, and walking surfaces will be ALCOA No Slip type. Upon request by the Purchaser, the manufacturer will supply proof of compliance with this requirement.

ALUMINUM BODY SUB-FRAME

The body sub structure will be an all welded configuration utilizing a combination of $3" \ge 1-1/2"$ 6061-T6 thick walled structural tubing and 6061 structural channel.

This structure will be designed to totally support the full length and width of the body and will 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 will be bolted to the sides of the chassis frame at four (4) points.

The two (2) forward mounting points will utilize a spring mount to help isolate the body from chassis deflection.

This design will 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

The fire body will be 100" wide to provide the maximum amount of usable hose bed and compartment space. The side body compartments will be 29" deep in any full depth areas and 14" deep in any split depth areas.

SWEEP-OUT COMPARTMENTS

Compartment floors will be welded to the compartment walls and have a sweep out design for easy cleaning.

Compartments with hinged doors will have the door opening flanges bend down to produce the sweep-out design.

Compartments with roll-up style doors will have the external floor flange stepped down, 1/2" high x 2" deep, to produce a sealing surface for the roll-up doors below the compartment floor.

The sweep out design will also permit easy cleaning.

3/16" ALUMINUM BODY

All compartment panels and body side sheets will be entirely 3/16" aluminum (5052-H32). Each side compartment assembly will 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 will be welded on a fixture to ensure true body dimensions of all door openings.

The side compartments and body side panels are then set into a body squaring fixture where the super structure is installed and the entire body is aligned to be completely symmetrical. The super structure is then welded to the compartment side panels and reinforcement plates are inserted which allows the compartment panels to become an integral component of the body support structure. A full seam weld will not be used due to the applied heat which could distort sheet metal and remove the protective coating from the perimeter of the welded area. All seams will be caulked prior to finish paint to ensure proper compartment seal.

BODY FENDER WELLS

The body fenders will be 64" long. This will 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.

DRIVER SIDE FORWARD FENDER - TRIPLE STORAGE SLOT

A storage compartment will 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 will 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 will be 26" deep.

The compartment will have a non-abrasive lined cradle storage area for each of the three (3) devices.

This storage compartment will provide a minimum of 2.3 cubic feet of storage space.

DRIVER SIDE REARWARD FENDER - DOUBLE STORAGE SLOT

A storage compartment will 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 will be sized as tall and wide as possible in the fender (minimum of 15" wide x 7-3/4" tall), and will be 26" deep.

The compartment will have a non-abrasive lined cradle storage area for each of the devices.

This storage compartment will provide a minimum of 1.6 cubic feet of storage space.

OFFICER SIDE FORWARD FENDER - TRIPLE STORAGE SLOT

A storage compartment will 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 will 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 will be 26" deep.

The compartment will have a non-abrasive lined cradle storage area for each of the three (3) devices.

This storage compartment will provide a minimum of 2.3 cubic feet of storage space.

OFFICER SIDE REARWARD FENDER - TRIPLE STORAGE SLOT

A storage compartment will 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 will 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 will be 26" deep.

The compartment will have a non-abrasive lined cradle storage area for each of the three (3) devices.

This storage compartment will provide a minimum of 2.3 cubic feet of storage space.

FENDER STORAGE COMPARTMENTS - PAINTED DOORS

The fender storage areas will be enclosed by a hinged door fabricated from the same material as the primary body construction, and painted the primary body color.

The back side of the door will have a section of Nylatron installed to protect the door surface from the items stored in the compartment.

Each door will 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.

DRIVER'S SIDE COMPARTMENTATION

One (1) full height/full depth compartment, with a roll up door, will be provided forward of the rear wheels. Compartment dimensions shall be approximately 68" high x 49" wide x 29" deep, with a door opening of 64" high x 46" wide.

One (1) high side compartment, with a roll up door, will be provided above the rear wheels. Compartment dimensions shall be approximately 36" high x 64" wide by 29" deep, with a door opening of 33-1/2" high by 58" wide.

One (1) full height/full depth compartment, with a roll up door, will be provided behind the rear wheels. Compartment dimensions shall be approximately 68" high x 46" wide x 29" deep, with a door opening of 64" high x 46" wide.

OFFICER'S SIDE COMPARTMENTATION

One (1) full height/split depth compartment, with a roll up door, will be provided forward of the rear wheels. Compartment dimensions shall be approximately 68" high x 49" wide x 29" deep in the lower 30" high area, 14" deep in the upper 38" high area, with a door opening of 64" high x 46" wide.

One (1) high side compartment, with a roll up door, will be provided above the rear wheels. Compartment dimensions shall be approximately 36" high x 64" wide by 14" deep, with a door opening of 33-1/2" high by 58" wide.

One (1) full height/split depth compartment, with a roll up door, will be provided behind the rear wheels. Compartment dimensions shall be approximately 68" high x 46" wide x 29" deep in the lower 30" high area, 14" deep in the upper 38" high area, with a door opening of 64" high x 46" wide.

The water tank capacity will be reduced by the size of the foam tank added.

ISOLATED REAR STEP COMPARTMENT

One (1) rear step compartment 51" high x 42" wide x 29" deep in the lower portion and 12" deep in the upper portion will be provided with a door opening of 47 5/8" high x 42" wide.

ROLL-UP DOORS

Roll-up doors will be provided on all compartments.

The roll-up doors will be constructed from aluminum extruded slats which will have a flexible seal between each slat for proper sealing of the door.

A synthetic rubber seal will be provided at each side, top and bottom edge of the door to prevent entry of dirt into the compartment.

The door will be equipped with a lift bar style latch mechanism which will latch at the bottom of the door mounting extrusion.

The roll-up door assembly will be furnished with a spring-loaded, counterbalance assembly to assist in door actuation.

All running board and high side compartments will be equipped with roll-up doors.

AMDOR BRAND ROLL-UP DOORS

The roll-up doors will be Amdor brand roll-up doors. They should be equipped with a satin finish and a dual durometer slat seal. The slats will be made from a 1" double-wall aluminum and have a continuous ball and socket hinge joint. The interior of the door will be made of a smooth interior door curtain, preventing equipment hang-ups. The bottom panel flange will have a stainless steel lift bar latching system. The lifting bar will have a cut out for easy access if using gloves.

WHEEL WELL LINERS WITH FENDERETTE

Fully removable, one piece, bolt-in, aluminum rear wheel well liner and fenderette will be provided. The wheel well liners will be natural metal finish and will protect the front and rear compartments and the main body supports from damage. Wheel well liners and fenderettes which are welded in place or are only partially removable will not be considered.

REAR MUD FLAPS

Heavy duty mud flaps will be provided behind the rear wheels.

REAR BODY PANEL

The rear body panel will extend the full width between the body side compartments. This panel will be full height from the rear step to the hose bed floor.

No part of the rear panel will be attached to the booster tank. The rear body panel material will be aluminum tread plate as standard.

If Chevron striping is specified for the rear of the body then smooth aluminum will be utilized.

TREAD PLATE OVERLAY - FRONT OF SIDE COMPARTMENTS (NON-WRAPPING)

The front face of the side compartments, next to the driver and officer pump panels will be overlaid with full height aluminum tread plate protection panels.

The overlays will cover the front face of the compartments only, they will not wrap around to the door opening.

BODY RUB RAILS

Sacrificial brushed stainless steel C-Channel style, rub rails will be mounted at the base of the body, extending outward from the body. The rub rails will extend the full length of the main body. Rub rails will be bolted to the body from the bottom side of the compartment area so it

does not damage the body side panels on initial impact and provide easy replacement.

EXTENDED REAR STEP

The rear step will be fabricated from 3/16" polished aluminum tread plate and will be rigidly reinforced. The rear step will extend 12" past the rear edge of the body and will be 100" wide with tapered corners.

The rear edge of the step will be designed to accommodate the rear clearance lights and recessed for protection in the step reinforcement channel. The step tread plate overlay will be bolted to the step frame for ease of replacement.

BODY GRAB RAILS

All handrails will be 1-1/4" outer diameter, knurled bright anodized aluminum extrusion, designed to meet NFPA 1901 requirements.

Molded gaskets will be installed between the handrail stanchion castings and body surfaces to prevent electrolytic reaction between dissimilar metals and to protect paint. Grab rails will be provided at the following specified locations.

Additional grab rails will be provided adjacent to any additional steps specified to comply with NFPA 1901.

TWO (2) VERTICAL RAILS ON REAR

Two (2) vertical rails will be mounted on the rear edge of the beavertails, one (1) each side.

ONE (1) HANDRAIL BELOW HOSE BED LEVEL

One (1) horizontal, full width handrail will be installed on the rear, below the level of the hose bed.

HANDRAIL ABOVE PUMP PANEL - EACH SIDE

Two (2) horizontal handrails will be mounted above each pump panel, (1) each side.

INNOVATIVE CONTROLS LIGHTED STEPS – DRIVER SIDE FRONT OF BODY

Innovative Controls large lighted folding steps, with a textured chrome plate finish, will 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 STEPS – OFFICER SIDE FRONT OF BODY

Innovative Controls large lighted folding steps, with a textured chrome plate finish, will 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).

<u>INNOVATIVE CONTROLS LIGHTED FOLDING STEPS – DRIVER SIDE REAR OF</u> <u>BODY</u>

Innovative Controls large lighted folding steps, with a textured chrome plate finish, will 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).

<u>INNOVATIVE CONTROLS LIGHTED FOLDING STEPS – OFFICER SIDE REAR OF</u> <u>BODY</u>

Innovative Controls large lighted folding steps, with a textured chrome plate finish, will be provided on officer 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).

CHROME REAR TOW EYES BELOW BODY

Two (2) chrome plated tow eyes will be furnished on the rear of the vehicle. The tow eyes will be made from plate steel and will be bolted directly to the chassis frame rails with grade 8 bolts. The tow eyes will extend below the body. The tow eyes will be smooth and free from sharp edges. They will have a minimum eyelet hole of 2-1/2". The tow eyes will be chrome plated.

STANDARD HOSE BED

The hose bed will 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 the fire hose. For added strength, the hose bed side walls will be approximately 3" thick, providing a mounting surface for devices such as warning and scene lights. The inner hose bed side walls will be brushed aluminum panels, which will help prevent damage to painted surfaces when the hose is deployed. The front wall will be flanged inward 2" with a 1" downward return, providing additional rigidity to the front wall.

HOSE BED CAPACITY

The hose bed will be designed with enough storage capacity to carry the following specified hose load: **500' of 3", 2000' of 5" LDH**.

HOSE BED FLOORING

Flooring is to be constructed from extruded aluminum and have proper spaces for ventilation purposes. The flooring will be smooth and free from sharp edges to avoid any hose damage. The hose bed floor will be removable, providing access to the inner body framework.

ONE (1) 3/16" ADJUSTABLE HOSEBED PARTITION

One (1) fully adjustable 3/16" aluminum hose bed partition will be provided. The partition will be easily adjustable by channels, located at the front and rear of the hose bed. The partition will be removable for access to the booster tank.

HOSE BED COVER - VINYL WITH VELCRO

A hose bed cover will be provided and installed. The cover will be made from 22 ounce heavyduty vinyl coated polyester fabric (TXN 226). The cover will be sewn with ultraviolet resistant thread and have 2" wide nylon webbing sewn around the perimeter to provide additional strength. The cover will be secured to the top front body flange with Velcro and quarter turn fasteners. The top side body flange should also be secured with Velcro. A weighted flap will be furnished on the rear of the cover with two (2) bungee cords.

The vinyl material will be red in color.

SIDE OF WATER TANK LADDER STORAGE (OFFICER SIDE)

The ground ladders will be stored vertically next to the water tank, behind the side body compartments and on the officer side of the apparatus.

To secure the ground ladders, a hinged rear access door will be provided and tied into the "Do Not Move Apparatus" warning system.

ALCO-LITE GROUND LADDER COMPLIMENT

The following Alco-Lite ground ladders will be supplied with this apparatus upon completion:

- One (1) Alco-Lite model PEL-24; 24', aluminum, two (2) section extension ladder.
- One (1) Alco-Lite model PRL-14; 14', aluminum, straight roof ladder with folding hooks.
- One (1) Alco-Lite model FL-10; 10', folding, aluminum, attic ladder.

PIKE POLE TUBES

Two (2) pike pole tubes will be provided. Each holder will be accessible from the rear of the apparatus. Each pike pole holder will be labeled to indicate the pike pole length.

LOCATION PIKE POLE TUBES

The pike pole tubes will be mounted in the ladder storage compartment.

SUCTION HOSE STORAGE BUILT INTO BODY

The suction hoses will be located beneath the hose bed. There will be one (1) on the driver side and one (1) on the officer side. The hose storage area will be accessed from the rear of the apparatus.

Note: On bodies with roll up style doors, the storage area will be behind the roll of the door and will not affect usable compartment space. On bodies with hinged style doors, the storage area will be in the top corner of the compartment.

A vertically hinged smooth aluminum, finish painted to match the body, access door with thumb type latches, will be provided on the compartments. The door will be provided with a door switch that ties into the "Do Not Move Apparatus" warning system.

TWO (2) 10' SECTIONS OF 6'' KOCHECK LIGHT WEIGHT SUCTION HOSE

Two (2) 10' sections of six (6) inch Kochek (PVC) suction hose with lightweight hard coat couplings will be furnished. Couplings will include a long handle with a female swivel on one end and a rocker lug male on the other. All threads will be six (6) inch N.S.T.

REVERSE CONTROL BACK-UP SAFETY SYSTEM

A Reverse Control, #500-1445 vehicle backing safety system will be provided and installed. The system enables a person to send audible and visual signals to the driver using a handheld transmitter to signal whether or not it is safe to back up or to stop. The transmitter incorporates a "dead-man" safety switch to help protect the spotter. The complete system will consist of:

A 900 MHz handheld Wireless Transmitter with mounting bracket Factory paired 900 MHz Receiver

Wiring cable assembly harness with intercom interface outputs NMO mount, exterior surface, antenna with cable assembly

Cab Speaker audible tone assembly Set of two self-dimming LED visual indicator assemblies with wire block and connectors

1/2 DEPTH ADJUSTABLE SHELF DESCRIPTION

Compartment shelving will be constructed of 3/16" brush finish aluminum with a 2" upward bend at front and rear, and side supports. Shelving will be vertically adjustable with spring nuts

in aluminum strut channel. Half depth adjustable shelves will be located as indicated at each compartment description.

1/2 DEPTH ADJUSTABLE SHELVING LOCATIONS

- One (1) located in the left side compartment #1
- One (1) located in the right side compartment #1

ADJUSTABLE SHELF DESCRIPTION

Compartment shelving will be constructed of 3/16" brush finish aluminum with a 2" upward bend at front and rear, and side supports. Shelving will be vertically adjustable with spring nuts in aluminum strut channel.

Adjustable shelves will be located as indicated at each compartment description.

ADJUSTABLE SHELVING LOCATIONS

- One (1) located in the left side compartment #3
- One (1) located in the right side compartment #3

ALUMINUM STRUT CHANNEL FOR FUTURE SHELVING

Four (4) Aluminum Strut Channels will be installed for future shelving installation in the following compartments:

- Left side compartment #1
- Left side compartment #2
- Left side compartment #3
- Right side compartment #1
- Right side compartment #2
- Right side compartment #3

250# FLOOR MOUNTED ROLLOUT TRAY DESCRIPTION

Slide out floor mount compartment shelving will 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 will have gas shocks to hold the tray in and out.

Slide out floor mount shelving will be as indicated at each compartment description.

250# ROLLOUT TRAY LOCATIONS

- One (1) located in the left side compartment #1

600# FLOOR MOUNTED ROLLOUT TRAY DESCRIPTION

Floor mounted roll-out trays will consist of heavy duty, roller bearing slide tracks with a load rating of 600 pounds, securely fastened to the compartment floor. The slide will have a pull type latch to secure the slide in the desired position. The slide tracks will have a 100% extension.

The tray will be fabricated from 3/16" brushed aluminum with a minimum 2" high flange on each of the four sides to assist in retaining the equipment stored on each tray.

The 600 pound floor mounted roll out trays will be as indicated at each compartment description.

600# SLIDEMASTER ROLLOUT TRAY LOCATIONS

- One (1) Located in the left side compartment #3

DRI-DEK MATERIAL ON ALL COMPARTMENT FLOORS

Dri-Dek brand floor material will be installed on all compartment floors. The Dri-Dek will be custom installed to provide full floor coverage. Floor matting material will be provided on the six (6) of the specified shelves and/or roll-out trays.

GENERAL PAINT DESCRIPTION

The apparatus body will be painted with Sikkens paint product. The paint process will meet or exceed current state regulations concerning paint operations. Pollution control will include measures to protect the atmosphere, water, and soil. The manufacturer will, upon demand, provide evidence that the manufacturing facility is in compliance with State EPA rules and regulations.

The exterior will 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 will be painted separately to assure proper paint coverage on body, door jambs and door edges.

Paint process will feature Sikkens high solid LV products and be performed in the following steps:

- Corrosion Prevention all aluminum surfaces will 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 will 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 will be applied, providing excellent coverage and durability. A minimum of two (2) coats will be applied.

• Sikkens High Solid LVBT650 (Clear coat) - high solid LV clear coat will be applied as the final step in order to ensure full gloss and color retention and durability. A minimum of two (2) coats will be applied.

Any location where the material is penetrated after painting, for the purpose of mounting steps, handrails, doors, lights, or other specified components will be treated at the point of penetration with a corrosion inhibiting pre-treatment (ECK Corrosion Control). The pre-treatment will 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, handrails, doors, lights, or other specified components will be individually treated with the corrosion inhibiting pre-treatment.

After the paint process is complete, the gloss rating of the unit will be tested with a 20 degree gloss meter. Coating thickness will be measured with a digital MIL gauge and the orange peel with a digital wave scan device.

GENERAL PRIMER & PREP DESCRIPTION

All exposed welds will 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 will be used in preparation for priming.

GENERAL FINISH PAINT DESCRIPTION

The body will be finish sanded and prepared for final paint.

Upon completion of final preparation, the body will be painted utilizing the highest quality, state of the art, low V.O.C., polyurethane base paint.

Finish paint will be applied in multiple coats to ensure proper paint coverage with a high gloss finish.

CUSTOM FINISH PAINT & PREP

The entire cab will be finish sanded and prepared for final paint.

Upon completion of final preparation, the cab will be painted utilizing the highest quality, state of the art, low V.O.C., polyurethane base paint.

Finish paint will be applied in multiple coats to ensure proper paint coverage with a high gloss finish.

CUSTOM CAB PRIMER & PREP

The cab primer will be a two (2) stage process.

First stage will be a coating with a two part component, self-etching, corrosion resistant primer to chemically bond the surface of the metal for increased adhesion.

Second stage will be multiple coats of a catalyzed, two component polyurethane, primer applied for leveling of small imperfections and topcoat sealing.

CAB UNDERSIDE PAINT

The exposed areas under the cab will be painted job color to match the exterior cab. On two tone cabs, this will match the primary color.

CAB BUFFING & FINISH

The exposed exterior finish of the cab will be buffed and detailed.

CAB INTERIOR PAINT

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

COMPARTMENT INTERIOR FINISH

The interior of the aluminum body compartments will have an unpainted, "DA" finish inside. All seams will be caulked with a clear silicone type caulking.

COMPARTMENT INTERIOR FINISH

The interior of the aluminum body compartments will have an unpainted, "DA" finish inside. All seams will be caulked with a clear silicone type caulking.

BODY BUFFING & FINISH

The visible and exposed areas of the body will be buffed and detailed.

INSIDE / UNDERSIDE BODY PAINT

The inside and underside of the complete body assembly will be painted job color using a Sikkens paint system, prior to installation of the body on the chassis or torque box

COMPARTMENT INTERIOR FINISH

The interior of the compartments will be finish painted with Multispec scuff resistant paint to provide a protective application over all of the compartment interior surfaces.

FENDER COMPARTMENT INTERIOR

The interior of the fender storage compartments (if fender compartments are specified) will be finish painted job color.

CAB PAINT SCHEME

The cab exterior will be finish painted with Sikkens paint system, single color, to match Mohegan Fire Company's furnished paint code.

PUMPHOUSE & PLUMBING PAINT

The pump enclosure and pump/plumbing within the pump enclosure will be painted job color.

SINGLE COLOR BODY PAINT SCHEME

The body paint finish will be Sikkens paint system in a single color to match Mohegan Fire Company's furnished paint codes and requirements.

PINT OF TOUCH-UP PAINT

One (1) pint of each exterior color paint for touch-up purposes will be supplied when the apparatus is delivered to the end user.

FINALIZATION & DETAILING

Prior to delivery of the vehicle, the interior and exterior be cleaned and detailed.

The finalization process detailing will 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

The chassis frame rails, suspension, axles, and drivelines (with the exception of any PTO drivelines which will be safety yellow) will be painted with polyurethane paint to match the body color code prior to installation of any air lines or electric systems to ensure proper serviceability.

WHEEL AND HUB PAINT

The chassis wheels and hubs will be provided as painted by the original wheel and axle manufacturers.

All outer wheels on the rear axle will be job color with the inner being a color selected by the wheel manufacturer suitable for inner wheel use.

SCOTCH-LITE STRIPE

A four (4) inch high "Scotch-Lite" stripe will be provided.

The stripe will 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 will be determined by Mohegan Fire Company.

WHITE SCOTCH-LITE

The Scotch-Lite will be white in color.

REAR CHEVRON STRIPING

REAR CHEVRON STRIPING

50% VERTICAL SURFACE

At least 50% of the rear facing vertical surface will be covered with alternating strips of reflective striping.

6" 50% REAR ORALITE CHEVRON STRIPING

The striping will be 6" Oralite reflective striping.

RED & FLOURESCENT YELLOW ORALITE V98

The Oralite V98 reflective tape will be 012 red and L1 fluorescent yellow in color.

MISCELLANEOUS EQUIPMENT

The following equipment will be mounted as specified or as loose equipment provided with the completed apparatus at the time of delivery:

ROAD SAFETY KITS

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

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

WHEEL CHOCKS

Two (2) ZICO #SAC-44 folding wheel chocks will be mounted forward of the rear wheels on the driver side below the side running board compartments.

MANUFACTURER WARRANTY STARTING ON IN-SERVICE DATE

Warranty coverage by the manufacturer will begin when the customer places the unit in service.

TWO (2) YEAR BASE WARRANTY WITH CUSTOM CHASSIS

The proposed vehicle includes a two (2) year new vehicle warranty, upon delivery and acceptance of the vehicle. The warranty will ensure that the vehicle has been manufactured to the proposed contract specifications and will be free from defects in material and workmanship that may appear under normal use and service within the warranty period. The warranty may be subject to different time and mileage limitations for specific components and parts. This warranty is issued to the original purchaser of the vehicle.

The warranty will not apply to tires, batteries, or other parts or components that are warranted directly by their manufacturers. The warranty will not apply to routine maintenance requirements as described in the service and operator's manual. No warranty whether express, implied, statutory or otherwise including, but not limited to any warranty of merchantability or fitness for purpose will be imposed.

OVERALL UNIT AND CUSTOM CHASSIS

All components and parts of the vehicle are warranted for a period of two (2) years from acceptance of the vehicle unless excluded elsewhere in this warranty or described as having longer time limitations.

FIVE (5) YEAR CUMMINS BASE WARRANTY

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.

FIVE (5) YEAR ALLISON EVS TRANSMISSION WARRANTY

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.

THREE (3) YEAR COOLING SYSTEM WARRANTY

The manufacturer shall warrant all Cooling System Equipment components used in the construction of the 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.

LIFETIME FRAME RAIL WARRANTY

The proposed custom chassis frame and cross members will be warranted to the original purchaser for the life of the vehicle. A copy of the frame rail warranty will be supplied to define additional details of the warranty provisions.

SHEPPARD STEERING GEAR STANDARD WARRANTY

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.

FIVE (5) YEAR MERITOR SINGLE AXLE REAR WARRANTY

The Meritor axle will be furnished with a five (5) year warranty; the first two (2) years will be parts and labor, the remaining three (3) years will be parts only. Wheel seals, gaskets and wheel bearings will be covered for one (1) year providing that Meritor supplies and assembles the wheel end equipment. A copy of the warranty from Meritor will be supplied to define additional details of the warranty provisions. For vehicles that operate full or part-time outside of the United States and Canada, a one (1) year parts only warranty will apply.

THREE (3) YEAR MERITOR ABS WARRANTY

The Meritor ABS will be provided with a three (3) year warranty, parts and labor. A copy of Meritor's warranty will be supplied to define additional details of the warranty provisions. Vehicles that operate full or part-time outside the United States and Canada will have a one (1) year, parts only warranty.

TEN (10) YEAR CAB STRUCTURAL WARRANTY

The proposed cab will be warranted against structural defects for a period of ten (10) years from the date of acceptance of the unit. Details of warranty coverage, limitations and exclusions are included in the specific warranty document.

TEN (10) YEAR BODY STRUCTURAL WARRANTY

The proposed body will be warranted against structural defects for a period of ten (10) years from the date of acceptance of the unit. Details of warranty coverage, limitations and exclusions are included in the specific warranty document.

TEN (10) YEAR CAB & BODY CORROSION WARRANTY

The cab and body will be warranted against rust-through or perforation, due to corrosion from within, for a period of ten (10) years. Perforation is defined as a condition in which an actual hole occurs in a sheet metal panel due to rust or corrosion from within. Surface rust or corrosion caused by chips or scratches in the paint is not covered by this warranty.

TEN (10) YEAR PAINT FINISH WARRANTY

The proposed paint finish will be warranted for a period of ten (10) years from the date of acceptance of the unit. Details of warranty coverage, limitations and exclusions are included in the specific warranty document.

FIVE (5) YEAR LETTERING WARRANTY

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 OF 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.

ONE (1) YEAR BRIGHTWORK WARRANTY

The manufacturer shall warrant all bright finish components used in the construction of the 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.

TEN (10) YEAR STAINLESS STEEL PIPING WARRANTY

The proposed stainless steel plumbing will be warranted for a period of ten (10) years from the date of acceptance of the unit. Details of warranty coverage, limitations and exclusions are included in the specific warranty document.

FIVE (5) YEAR STEERTEK FRONT SUSPENSION WARRANTY

The Hendrickson Steertek NXT front axle will be provided with a five (5) year parts and labor warranty and will 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 will 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 will be provided to define additional details of the warranty provisions.

ONE (1) YEAR REYCO LEAF SPRING WARRANTY

Reyco Granning 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 one (1) year.

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 parts of The Company or altered by anyone.

LIFETIME POLY TANK WARRANTY - ALL TANKS

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 LIMITED STANDARD WARRANTY

Hale Products, Incorporated ("Hale") hereby warrants to the original buyer that products manufactured by Hale will 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 will be first to expire. Within this warranty period, Hale will cover parts and labor for the first two (2) years and parts only for years three (3) through five (5).

TEN (10) YEAR ELKHART HEAVY DUTY VALVE WARRANTY

Elkhart Brass warrants Heavy Duty Swing-Out Valves for a period of ten (10) years after purchase against defects in material or workmanship. Elkhart Brass will repair or replace any Heavy Duty Swing Out Valve which fails to satisfy this warranty.

CLASS 1 ELECTRICAL PRODUCT WARRANTY

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.

FIVE (5) YEAR BOSTROM SEATING WARRANTY

H.O. Bostrom 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 five (5) years. Labor to remove or reinstall and transportation of defective items will not be covered by, or any allowance made for the said cost under this warranty.

CORROSION TREATMENT

Upon apparatus completion, underside of the apparatus, from the pump enclosure-back, will have anti corrosion film applied to help inhibit rust and the corrosion process. The semi-firm wax film will be applied by air spray method. The film will 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 will be applied directly to the exhaust system or wheel wells.

NOTE: The film will remain semi-firm to promote self-sealing. The film may leave a light tinted color to those areas treated.