DAVIESS COUNTY FISCAL COURT  
212 St. Ann Street, Room 202  
Owensboro, KY 42303  
(270)-685-8424  
www.daviessky.org  
County Government > Current Bid Documents

**Invitation for Bid: 15-2021: TWO (2) NEW CUSTOM PUMPERS (FIRE RESCUE)**

BIDS SHALL BE ACCEPTED UNTIL: **THURSDAY, JULY 8, 2021, @ 2:00 P.M. LOCAL TIME, AT WHICH POINT THEY WILL BE OPENED AND PUBLICLY READ AT THE DAVIESS COUNTY COURTHOUSE.**

| SPECIFICATION CONTACT |  |
|------------------------|  |
| Jeremy Smith           |  |
| Daviess County Fire Department |  |
| 270-685-8440           |  |
| jsmith@daviessky.org   |  |

| CONTRACT CONTACT |  |
|------------------|  |
| Jordan Johnson   |  |
| Daviess County Fiscal Court |  |
| 270-685-8424     |  |
| jjohnson@daviessky.org |  |

**MAIL ONE (1) COMPLETE COPY WITH VENDOR AND BID INFORMATION AS SHOWN IN SAMPLE**

**SAMPLE ENVELOPE**

**Vendor Name**  
**Vendor Address**  
**Attn:** Purchasing Department  
**Contact Number**  
Daviess County Fiscal Court  
212 St. Ann Street, Room 202  
Owensboro, KY 42303

**SEALED BID: (Bid Name)**

The undersigned certifies that he/she has the authority to bind this company in an agreement/contract to supply the commodity or service in accordance with all terms, conditions, and pricing specified. By signing and submitting this bid, the Vendor acknowledges that they have read, understand and agree to all aspects of the specifications and bid requirements as presented without reservation or alteration. This Bid, if accepted, will constitute an Agreement and Contract with Daviess County, Kentucky, upon approval by Daviess County Fiscal Court. Prices are firm during this agreement term, unless agreed upon in writing by the County.

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2.0 BID FORM: TWO (2) NEW CUSTOM PUMPERS (FIRE RESCUE)

THE LUMP SUM PRICING BELOW INCLUDES ALL OVERHEAD, PROFIT, INSURANCE, TAXES, DELIVERY FEES, AND OTHER COSTS NECESSARY TO PROVIDE AND DELIVER ALL SPECIFIED UNITS.

UNIT 1

MAKE ______________________________
MODEL ______________________________
YEAR ______________________________
TOTAL BID PRICE ______________________________
ESTIMATED DELIVERY DATE _____/_____/__________

UNIT 2

MAKE ______________________________
MODEL ______________________________
YEAR ______________________________
TOTAL BID PRICE ______________________________
ESTIMATED DELIVERY DATE _____/_____/__________

Any Exceptions to the Bid?* □ Yes □ No

*IF YES, INCLUDE DOCUMENTATION FOR ANY AND ALL EXCEPTIONS AND WHAT SECTIONS THEY PERTAIN TO. FAILURE TO PROPERLY RECORD EXCEPTIONS COULD RESULT IN IMMEDIATE REJECTION OF THE BID.
2.1 GENERAL SPECIFICATIONS

I. SCOPE: Daviess County Fiscal Court is seeking a qualified vendor to supply two (2) new custom pumpers for the Daviess County Fire Department according to the specifications presented herein.

II. DELIVERY: Delivery will be made to 5005 Highway 54 East, Owensboro, KY 42303. Delivery of Unit 2 will not be accepted until after July 1, 2022.

III. MANUALS: Operator and Maintenance manuals shall be delivered with the equipment.

IV. MACHINE EQUIVALENCY CLAUSE: The bid specifications mention and in some places are specific to a particular manufacturer and brand. This is merely to convey the target performance desired by the County. It is not the intention of the specifications within this document to eliminate any bidder; however, quoted items must equal or exceed stated specifications. Sufficient documentation is required to verify equivalent or superior performance.

V. COMPLIANCE: Bidders shall check either Y(es) and N(o) for the compliance of their quoted product in the fields available throughout the specifications.

2.2 BODY SPECIFICATIONS

INTENT OF SPECIFICATIONS

It shall be the intent of these specifications to provide a complete apparatus equipped as hereinafter and as specified. With a view to obtaining the best results and the most acceptable apparatus for service in the Department, these specifications cover only the general requirements as to the type of construction and tests to which the apparatus must conform, together with certain details as to finish, equipment and appliances with which the successful bidder shall conform. Minor details of construction and materials where not otherwise specified are left to the discretion of the contractor, who shall be solely responsible for the design and construction for all features. The manufacturer shall provide loose equipment only when specified by the customer. The (NFPA) 1901, Standard for Automotive Fire Apparatus, unless otherwise specified as requested by the customer in these specifications, shall prevail.

The apparatus must meet all NFPA, DOT, ICC, AE, TRA, FMVSS and local state Motor Vehicle Requirements.

It is required that the apparatus be manufactured to current NFPA edition standards, all NFPA equipment (LOOSE EQUIPMENT) not specified in the specifications will not be provided by the contractor.

Bids shall only be considered from companies that have an established reputation in the field of fire apparatus construction that have been in business and construction for a minimum of twenty-five (25) years.

The bidder of the apparatus herein specified; shall be wholly owned (100%) and managed by a Company, Corporation, and/or Parent Company that is wholly based, and permanently resides in the United States of America.

The Company, Corporation, and/or Parent Company and all assets belonging to such; shall be wholly owned and managed (100%) by the entities specified above.

The bidder shall state the location of the manufacturing facility where the apparatus is to be built and the location of the parent company if a subsidiary of a manufacturer.

The bidder shall provide satisfactory evidence of their ability to construct the apparatus specified in the bidders manufacturing facilities.

The bidder’s representation shall state the length of time representing the manufacturer of specified apparatus.

Due to the severe service requirements the department will impose on the apparatus as specified, each bidder shall
provide a list of at least six (6) departments in which similar apparatus utilizing the brand of chassis proposed have been in service for over one year. This list shall include contact names and phone numbers.

The bid shall be accompanied by a set of “Contractor's Specifications” consisting of a detailed description of the apparatus being furnished under this contract which conform. Computer runoff sheets are not acceptable as “Contractor's Specifications”. Item compliance shall be indicated in the “Yes/No” column of each item by all Bidders. Note: Each bidder shall submit their bid in the same sequence as these specifications to allow the department to easily compare. NO EXCEPTIONS

These specifications shall indicate size, type, model and make of all component parts and equipment. NO EXCEPTIONS

QUALITY AND WORKMANSHIP

The design of the Apparatus shall embody the latest approved automotive engineering practices.

The workmanship must be of the highest quality in its respective field. Special consideration will be given to the following points: Accessibility of the various units, which require periodic maintenance, ease of operation (including both pumping and driving) and symmetrical proportions.

Construction shall be rugged and ample safety factors shall be provided to carry loads as specified and to meet both on and off road requirements and to speed conditions as set forth under “Performance tests and requirements”.

Welding shall be employed in the assembly of the apparatus in a manner that will not prevent the ready removal of any component part for service or repair, with apparatus bodies of bolt together design not being acceptable.

All steel welding shall follow American Welding Society requirements for AWS D1.1:2012 Structural Welding Code for welding steel structural assemblies. All aluminum welding shall follow American Welding Society requirements for AWS D1.2/D1.2M:2003 Structural Welding Code for any type structure made from aluminum structural alloys. All sheet metal welding shall follow American Welding Society AWS D9.1M/D9.1:2006 Structural Welding code for Arc/Braze requirements of non-structural materials. All pressure pipe welding shall follow American Society of Mechanical Engineers ASME IX/ASME B31:2010 requirements to the qualification of procedures in welding and brazing, in accordance with the ASME Boiler and Pressure Vessel Code and the ASME B31 Code for Pressure Piping. Flux core arc welding to use alloy rods, type 7000, American Welding Society AWS standards A5.20-E70T1. The manufacturer shall be required to have an American Welding Society certified welding inspector in plant during testing operations within working hours to monitor weld quality.

Employees classified as welders shall be tested and certified to meet American Welding Society and American Society of Mechanical Engineers welding codes.

DELIVERY

The bidder shall provide the number of calendar days from the date the bid is awarded to the delivery of the completed unit.

A qualified delivery engineer representing the contractor shall deliver the apparatus and instruct the Fire Department personnel in the proper operation, care and maintenance of the equipment delivered.

PERFORMANCE TESTS AND REQUIREMENTS

A road test shall be conducted with the apparatus fully loaded to its estimated in-service weight and shall be capable of the following performance while on dry paved roads that are in good condition and for a continuous run of ten (10) miles or more, during which time the apparatus shall show no loss of power or overheating. The transmission drive shaft or shafts and rear axles shall run quietly and be free from abnormal vibration or noise throughout the operating range of the apparatus. The successful bidder shall furnish a Weight Certificate showing weights on front axle, rear axles and total weight for the completed apparatus at time of delivery.

A. The apparatus shall be capable of accelerating to 35 MPH (55 km/hr) from a standing start within 25 seconds on a level concrete highway without exceeding the maximum governed RPM of the engine.

B. The apparatus, fully loaded, shall be capable of obtaining a minimum top speed of 50 MPH (80 km/hr) on a level dry concrete highway with the engine not exceeding its governed RPM (fully loaded).
C. The service brakes shall be capable of stopping a fully loaded vehicle in 35ft (10.7 m) at 20 mph (32.2 km/hr) on a level concrete highway. The air brake system shall conform to Federal Motor Vehicle Safety Standards (FMVSS) 121.

D. The apparatus, when fully loaded, shall have not less than 25 percent or more than 50 percent of the weight on the front axle, and not less than 50 percent nor more than 75 percent on the rear axle.

E. The contractor shall have the Underwriter’s Laboratories, LLC conduct the tests of the apparatus as in accordance with standard practices required by the Underwriter Laboratories, LLC (Guide for the Certification of Fire Department Pumper latest edition). A copy of all tests shall accompany the Apparatus. (For apparatus sold within Canadian ULC S515 latest revision shall prevail).

F. The contractor shall furnish copies of the Pump Manufacturer’s Certification of hydrostatic test, the Engine Manufacturer current certified brake horsepower curve, and the Manufacturer’s record of pumper construction details when delivered.

INFORMATION REQUIRED

The manufacturer shall supply at time of delivery, a complete operation and maintenance manual covering the completed apparatus as delivered.

A Fire Apparatus Safety Guide published by Fire Apparatus Manufacturer's Association shall be provided with the apparatus upon delivery. This manual includes essential safety information for fire fighters, fire chiefs, apparatus mechanics, and fire department safety officers. The guide is applicable to municipal, wildland, and airport firefighting apparatus manufactured on either custom or commercial chassis.

A permanent plate shall be mounted in the driver's compartment to specify the quantity and type of the following fluids used in the vehicle: Engine oil, engine coolant, and chassis transmission fluid, pump transmission lubrication fluid, pump primer fluid (if used) and drive axle lubrication fluid.

The manufacturer shall supply the final certification of GVWR and GAWR on a nameplate affixed to the vehicle.

A permanent plate in the driver's compartment shall be installed, specifying the seating capacity of the enclosed cab.

Signs that state "OCCUPANTS MUST BE SEATED AND BELTED WHEN APPARATUS IS IN MOTION" shall be provided and will be visible from each seated position. An accident prevention sign shall be located at the rear step area of the apparatus. It shall warn all personnel that standing on the step while apparatus is in motion shall be prohibited.

A nameplate indicating the chassis transmission shift selector position to be used when pumping shall be provided in the driving compartment and located so that it can be easily read from the driver's position.

LIABILITY

The bidder, if their bid is accepted, shall defend any and all suits and assume all liability for the use of any patented device or article forming part of the apparatus or any appliance provided under the contract.

GENERAL CONSTRUCTION

The apparatus shall be designed with due consideration to distribution of load between the front and rear axles, so that all specified equipment, including filled water tank, a full complement of personnel and fire hose will be carried without injury to the apparatus. Weight balance and distribution shall be in accordance with the recommendations of the (NFPA) 1901, Standard for Automotive Fire Apparatus, documentation.

The apparatus shall be designed so that all recommended daily maintenance checks can be performed easily by the operator without the need for hand tools. Apparatus components that interfere with repair or removal of other major components must be attached with fasteners (cap, screws, nuts, etc.) so that the components can be removed and installed with normal hand tools. These components must not be welded or otherwise permanently secured into place.

The GAWR and GVWR of the chassis shall be adequate to carry the fully equipped apparatus including all tanks filled, the specified hose load, unequipped personnel weight, ground ladders and a miscellaneous equipment allowance per NFPA criteria. It shall be the responsibility of the purchaser to provide the contractor with the weight of equipment to be carried if it is in excess of the allowance as set forth by NFPA.
The unequipped personnel weight shall be calculated at 250 lbs. per person times the maximum number of persons to
ride on the apparatus.

The height of the fully loaded vehicle's center of gravity shall not exceed the chassis manufacturer's maximum limit.

The front to rear weight distribution of the fully loaded vehicle shall be within the limits set by the chassis manufacturer.
The front axle loads shall not be less than the minimum axle loads specified by the chassis manufacturer, under full loads
and all other loading conditions.

The difference in weight on the end of each axle, from side to side, when the vehicle is fully loaded and equipped shall not
exceed 7 percent.

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

Where special tools manufactured or designed by the contractor and are required to provide routine service on any
component of the apparatus built or supplied by the contractor, such tools shall be provided with the apparatus.

EXCEPTIONS TO SPECIFICATIONS

The following specifications shall be strictly adhered to. Exceptions shall be allowed if they are equal to or superior to that
as specified and providing they are listed and entirely explained on a separate page entitled "Exceptions to
Specifications". The exceptions list to refer to specification page number and paragraph.

Proposals taking total exception to specifications or total exception to certain parts of the specifications such as Electrical
Systems, Chassis, Body or Pump, will not be accepted.

Prototype units will not be acceptable. Apparatus shall be inspected upon completion for compliance with specifications.

Deviations will not be tolerated and will be cause for rejection of Apparatus unless they were originally listed in bidder's
proposal and accepted in writing by the department.

If the bidder takes an exception, on the exception page, the bidder must state an option price to bring their specifications
into full compliance with the Department specifications.

Failure to provide this information shall be cause to reject the proposal as being non-responsive... NO EXCEPTIONS

Copied or run off sheets of these specifications shall be unacceptable and the bid will be rejected no exceptions.

PURCHASER'S RIGHTS

The Purchaser reserves the right to accept or reject any or all bids as it deemed in their best interests.

Bid (Generic Specs) Drawing

Y___N___

BID/PROPOSAL DRAWINGS

For purposes of evaluation, the bidder shall provide a drawing illustrating, but not limited to, the overall dimensions,
wheelbase, and overall length of the proposed apparatus and other specified equipment, shall be required to be included
with the bidder's proposal package.

The drawings shall be large "D" size (minimum 24.00 inches x 36.00 inches).

Smaller size drawings, "similar to" drawings or general sales drawings, shall not be acceptable.

Failure to provide a bid evaluation drawing in accordance with these specifications shall be cause for rejection of the bid
proposal.

Pre-Con (Generic Specs) Drawing WITH Pump Panel Approval

Y___N___

PRE-CONSTRUCTION DRAWINGS

After the award of the bid, the contractor shall provide detailed colored engineering drawings including, but not limited to,
the overall dimensions, wheelbase, and overall length of the proposed apparatus for use during the pre-construction conference.

The drawings shall include, but shall not be limited to the right, left, top, front and rear views of the apparatus.

In addition, a detailed engineering drawing of the pump operator’s panel shall be provided prior to manufacturing for fire department approval.

Single Source Manufacturer (Generic Specs)

Y___N___

SINGLE SOURCE MANUFACTURER

Bids shall only be accepted from a single source apparatus manufacturer.

The definition of single source manufacturer is a company that designs and manufactures their products utilizing an approach that includes complete product integration, including the apparatus chassis, cab, and body modules being constructed, assembled, and tested on company premises only.

Warranties qualified to the chassis and body design construction (excluding vendor component warranties such as engine, axles, transmission, and pumps, etc.) will be from a single source manufacturer and not separated between manufacturers (i.e. body and chassis). The bidder shall provide evidence of maintaining compliance to this requirement.

Tag On Order/Cooperative Purchasing Agreement (Generic)

Y___N___

TAG-ON ORDERS-COOPERATIVE PURCHASING

Other fire departments, metropolitan regions, or municipalities may purchase apparatus and equipment from same manufacture similar to the Apparatus and Equipment that is the subject of this Contract held by the same manufacture. The following terms shall apply to any such tag-on orders:

(a) Changes - Tag-on orders utilizing the same specification as the Apparatus and Equipment that is the subject of this Contract in order to provide favorable pricing and lead-times to other buyers due to having such specification fully engineered. Limited changes will be permitted. Such changes will be captured in the pre-construction meeting and the price of any tag-on unit adjusted accordingly.

(b) Term – Tag-on orders may be placed for a term of one year after the Effective Date of this Contract.

(c) Escalation - Manufacture reserves the right to adjust the price of any tag-on order if material costs escalate during the term of this Contract, changes in regulations become effective (for example EPA, NFPA or other), or the tag-on order would cross a model year.

(d) Acceptance – Manufacture holding the contract reserves the right to accept or reject any tag-on orders under this Contract.

Finite Element Analysis (Generic specs)

Y___N___

FINITE ELEMENT ANALYSIS AND TESTING

Finite Element Analysis (FEA) shall be provided by the manufacturer.

Prototype bodies have been subjected to rigorous testing over varied terrains simulating different environmental conditions.

The purpose of such complex engineering methods of analysis shall be to ensure the longevity of the design by analyzing stress levels throughout the body and incorporating the structural supports wherever necessary.

There shall have been a minimum of three (3) different load cases (per DOT, FHWA, and TTMA recommended practice) applied and analyzed to properly display the different areas and levels of stresses that will be present under the various operating conditions of the apparatus.

In addition to the FEA analysis, the core product design shall be strain gauged instrumental to ensure validation of FEA results and “Real World” drive/apparatus driving conditions.

Analysis shall also have been conducted on the mounting system for the apparatus body and pump house. EXCEPTIONS TO THIS STATEMENT MAY BE CAUSE FOR IMMEDIATE REJECTION AND/OR BE CONSIDERED NON-COMPLIANT.
The apparatus manufacturer shall supply two (2) hard copies of apparatus manuals with all manufactured apparatus.

The manuals shall include, but not be limited to: all component warranties, users' manuals and information for supplied products, apparatus engineering information including drawings and build prints, and whatever other pertinent information the manufacturer can supply to its customer regarding the said apparatus.

Included in the delivery of the unit, the manufacturer shall also include spare hardware and extra fasteners, paint for touch-up, information regarding washing and care procedures, as well as other recommendations for care and maintenance of the general apparatus.

The manufacturer shall also supply a manufacturer's record of apparatus construction details, including the following information:

- Owner name and address
- Apparatus manufacturer, model, and serial number
- Chassis make, model, and serial number
- GAWR of front and rear axles
- Front tire size and total rated capacity in kilograms
- Rear tire size and total rated capacity in kilograms
- Chassis weight distribution in kilograms with water (if applicable) and manufacturer mounted equipment (front and rear)
- Engine make, model, serial number, rated horsepower, related speed and no load governed speed
- Type of fuel and fuel tank capacity
- Electrical system voltage and alternator output in amps
- Battery make and model, capacity in CCA
- Paint numbers
- Weight documents from a certified scale showing actual loading on the front axle, rear axle(s), and overall vehicle (with the water tank full (if applicable) but without personnel, equipment, and hose)
- Written load analysis and results of the electrical system performance tests
- Transmission make, model, and type
- Pump to drive through the transmission (yes or no)
- Engine to pump gear ratio and transmission gear ratio used
- Pump make and model, rated capacity in gallons per minute, serial number, and number of stages
- Pump manufacturer's certification of suction capability
- Pump manufacturer's certification of hydrostatic test
- Pump manufacturer's certification of inspection and test for the fire pump
- Copy of the apparatus manufacturer's approval for stationary pumping applications
- Pump transmission make, model and serial number
- Priming device type
- Type of pump pressure control system
- The engine manufacturer's certified brake horsepower curve for the engine furnished, showing the maximum no load governed speed
- Certification of the water tank capacity

The apparatus manufacturer shall supply one (1) set(s) as-built wiring schematics, to include all line voltage schematics with each apparatus.

The apparatus manufacturer shall supply one (1) set(s) as-built wiring schematics, to include all line voltage schematics with each apparatus.

Warning and Information Labels - English

The apparatus manufacturer shall supply one (1) set(s) as-built wiring schematics, to include all line voltage schematics with each apparatus.
All warning and informational labels (non-vendor specific) shall be provided in compliance with (NFPA) 1901, Standard for Automotive Fire Apparatus, and installed in the appropriate locations to alert the operator of potential hazards and operating instructions.

**ON-LINE CUSTOMER INTERACTION**

The manufacture shall provide the capability for online access through the manufacture’s website. The customer shall be able to view digital photos of their apparatus in the specified phases of construction. The following phases will be captured and displayed on the manufacture’s website:

1. Chassis when available at manufacturing facility
2. Body – Prior to Paint
3. Body – Painted
4. Pump and Plumbing
5. Assembly – 80% Complete

Due to the complex nature of fire apparatus and the importance of communication between the manufacture and customer, this line item is considered a critical requirement. NO EXCEPTIONS

**LIABILITY INSURANCE COVERAGE**

In order to protect the department and its personnel, the bidder shall show proof that it has no less than $10 million in liability insurance in force. A certificate of coverage shall be included in the bid package. Failure to carry liability insurance of at least this amount or failure to include proof of coverage shall be cause to reject the bidder's proposal.

**GENERAL WARRANTY**

The manufacturer shall provide a two (2) year warranty from the date of delivery.

In the case of a commercial chassis being used, the warranty on the chassis, engine, transmission, tires, storage batteries, generators, electrical lamps and other devices subject to deterioration is limited to the warranty of the manufacturer thereof and adjustments for the same are to be made directly with the manufacturer by the customer.

**STRUCTURAL BODY WARRANTY**

A structural Aluminum body warranty shall be provided by the apparatus manufacturer for products of its manufacture to be free from defects in material and workmanship under normal use and service for a period of ten (10) years.

**PAINT WARRANTY**

A Prorated Paint Warranty shall be provided by the apparatus manufacturer for products of its manufacture to be free from defects in material and workmanship, under normal use and service, for a period of ten (10) years.

**PUMP WARRANTY**

Waterous Co shall provide a limited manufacturer's pump warranty to be free from defects, under normal use and service, for a period of seven (7) years from the date placed into service.

**PLUMBING WARRANTY**

A Stainless Steel Plumbing/Piping warranty shall be provided by the apparatus manufacturer for products of its manufacture to be free from defects in material and workmanship, under normal use and service, for a period of ten (10) years from the date of delivery.
TANK WARRANTY

A lifetime tank warranty will be provided by the tank manufacturer, UPF.

MULTI-PLEXED ELECTRICAL WARRANTY

A four (4) year limited (V-MUX) multiplex system warranty, of Weldon Technologies, Inc.; shall be provided by the apparatus manufacture for parts and labor, while under normal use and service; against mechanical, electrical and physical defects from the date of installation.

The warranty shall exclude; sensors, shunt interface modules, serial or USB kits, transceivers, cameras, GPS, and electrical display screens, which shall be limited to a period of one a (1) year repair parts and labor from the date of installation.

PUMP CERTIFICATION AND TESTING

The apparatus upon completion will be tested and certified by Underwriters Laboratories, LLC. The certification tests will follow the guide lines outlined in (NFPA) 1901, Standard for Automotive Fire Apparatus.

There shall be multiple tests performed by the contractor and Underwriter’s Laboratories, LLC when the apparatus has been completed. The manufacturer shall provide the completed Test Certificate(s) to the purchaser at time of delivery. The inspection services of Underwriters Laboratories, LLC are available to all bidders on an equal basis; therefore, no third party certification of testing results shall be acceptable.

The fire pump shall be mounted on the apparatus and shall have a minimum rated capacity of 250 gpm (1000 L/min) at 150 psi (1000 kPa) net pump pressure.

Where the apparatus is designed for pump in-motion operations, the vehicle drive engine and drive train shall be arranged so that the pump can deliver at least 20 gpm (76 L/min) at a gauge pressure of 80 psi (550 kPa), while the fire apparatus is moving.

If the pumping system provided is rated at 3000 gpm (12,000 L/min) or less, the pump shall be capable of delivering the following:

(1) One hundred percent of rated capacity at 150 psi (1000 kPa) net pump pressure

(2) Seventy percent of rated capacity at 200 psi (1400 kPa) net pump pressure

(3) Fifty percent of rated capacity at 250 psi (1700 kPa) net pump pressure

If the pumping system provided is rated at greater than 3000 gpm (12,000 L/min), the pump shall be capable of delivering the following:

(1) One hundred percent of rated capacity at 100 psi (700 kPa) net pump pressure

(2) Seventy percent of rated capacity at 150 psi (1000 kPa) net pump pressure

(3) Fifty percent of rated capacity at 200 psi (1400 kPa) net pump pressure

If the fire pump has a rated capacity of 750 gpm (3000 L/min) or greater, the pump shall be tested after the pump and all its associated piping and equipment have been installed on the apparatus.

The tests shall include at least the pumping test, the pumping engine overload test, the pressure control system test, the priming device tests, and the vacuum test.

A test plate shall be provided at the pump operator’s panel that gives the rated discharges and pressures together with the speed of the engine as determined by the certification test for each unit, the position of the parallel/series pump as used,
and the governed speed of the engine as stated by the engine manufacturer on a certified brake horsepower curve. The plate shall be completely stamped with all information at the factory and attached to the vehicle prior to shipping.

**Pumping Test:**

The test site shall be adjacent to a supply of clear water at least 4 feet (1.2 m) deep, with the water level not more than 10 feet (3 m) below the center of the pump intake, and close enough to allow the suction strainer to be submerged at least 2 feet (0.6 m) below the surface of the water when connected to the pump by 20 feet (6 m) of suction hose.

Tests shall be performed when conditions are as follows:

1. Air temperature: 0 degrees Fahrenheit to 110 degrees Fahrenheit (−18 degrees Celsius to 43 degrees Celsius)
2. Water temperature: 35 degrees Fahrenheit to 90 degrees Fahrenheit (2 degrees Celsius to 32 degrees Celsius)
3. Barometric pressure: 29 inches Hg (98.2 kPa), minimum (corrected to sea level)

Engine-driven accessories shall not be functionally disconnected or rendered inoperative during the tests.

The following devices shall be permitted to be turned off or not operating during the pump test:

1. Aerial hydraulic pump
2. Foam pump
3. Hydraulically driven equipment (other than hydraulically driven line voltage generator)
4. Winch
5. Windshield wipers
6. Four-way hazard flashers
7. Compressed air foam system (CAFS) compressor

All structural enclosures, such as floorboards, gratings, grilles, and heat shields, not provided with a means for opening them in service shall be kept in place during the tests.

All test gauges shall meet the requirements for Grade A gauges as defined in ASME B40.100, *Pressure Gauges and Gauge Attachments*, and shall be at least size 3 1/2 per ASME B40.100. The pump intake gauge shall have a range of 30 in. Hg (100 kPa) vacuum to zero for a vacuum gauge, or 30 in. Hg (100 kPa) vacuum to a gauge pressure of 150 psi (1000 kPa) for a compound gauge. The discharge pressure gauge shall have a gauge pressure range of 0 psi to 400 psi (0 kPa to 2800 kPa). All pilot gauges shall have a gauge pressure range of at least 0 psi to 160 psi (0 kPa to 1100 kPa). All gauges shall be calibrated in the month preceding the tests using a dead-weight gauge tester or a master gauge meeting the requirements for Grade 3A or 4A gauges, as defined in ASME B40.100, *Pressure Gauges and Gauge Attachments*, that has been calibrated within the preceding year.

The engine speed–measuring equipment shall consist of a nonadjustable tachometer supplied from the engine or transmission electronics, a revolution counter on a checking shaft outlet and a stop watch, or other engine speed–measuring means that is accurate to within ± 50 rpm of actual speed.

If the apparatus is equipped with a fire pump rated at 750 gpm (3000 L/min) or greater but not greater than 3000 gpm (12,000 L/min), the pump shall be subjected to a 3 hour pumping test from draft consisting of 2 hours of continuous pumping at rated capacity at a minimum of 150 psi (1000 kPa) net pump pressure, followed by 1/2 hour of continuous pumping at 70 percent of rated capacity at a minimum of 200 psi (1400 kPa) net pump pressure and 1/2 hour of continuous pumping at 50 percent of rated capacity at a minimum of 250 psi (1700 kPa) net pump pressure and shall not be stopped until after the 2 hour test at rated capacity, unless it becomes necessary to clean the suction strainer.

If the apparatus is equipped with a fire pump rated at greater than 3000 gpm (12,000 L/min), the pump shall be subjected to a 3 hour pumping test from draft consisting of 2 hours of continuous pumping at rated capacity at 100 psi (700 kPa) net pump pressure, followed by 1/2 hour of continuous pumping at 70 percent of rated capacity at 150 psi (1000 kPa) net pump pressure and 1/2 hour of continuous pumping at 50 percent of rated capacity at 200 psi (1400 kPa) net pump pressure and shall not be stopped until after the 2 hour test at rated capacity, unless it becomes necessary to clean the suction strainer.

If the apparatus is equipped with a fire pump rated at less than 750 gpm (3000 L/min), the pump shall be subjected to a 50-minute pumping test from draft consisting of 30 minutes of continuous pumping at rated capacity at a minimum of 150 psi (1000 kPa) net pump pressure, followed by 10 minutes of continuous pumping at 70 percent of rated capacity at a
minimum of 200 psi (1400 kPa) net pump pressure and 10 minutes of continuous pumping at 50 percent of rated capacity at a minimum of 250 psi (1700 kPa) net pump pressure and shall not be stopped until after the 30-minute test at rated capacity, unless it becomes necessary to clean the suction strainer.

**Pumping Engine Overload Test:**

If the pump has a rated capacity of 750 gpm (3000 L/min) or greater but not greater than 3000 gpm (12,000 L/min), the apparatus shall be subjected to an overload test consisting of pumping rated capacity at 165 psi (1100 kPa) net pump pressure for at least 10 minutes.

This test shall be performed immediately following the pumping test of rated capacity at 150 psi (1000 kPa).

The capacity, discharge pressure, intake pressure, and engine speed shall be recorded at least three times during the overload test.

**Pressure Control System Test:**

If the pump is rated at 3000 gpm (12,000 L/min) or less, the pressure control system on the pump shall be tested as follows:

1. The pump shall be operated at draft, delivering rated capacity at a discharge gauge pressure of 150 psi (1000 kPa).
2. The pressure control system shall be set in accordance with the manufacturer's instructions to maintain the discharge gauge pressure at 150 psi (1000 kPa) ±5 percent.
3. All discharge valves shall be closed not more rapidly than in 3 seconds and not more slowly than in 10 seconds.
4. The rise in discharge pressure shall not exceed 30 psi (200 kPa) and shall be recorded.
5. The original conditions of pumping rated capacity at a discharge gauge pressure of 150 psi (1000 kPa) shall be reestablished.
6. The discharge pressure gauge shall be reduced to 90 psi (620 kPa) by throttling the engine fuel supply, with no change to the discharge valve settings, hose, or nozzles.
7. The pressure control system shall be set according to the manufacturer's instructions to maintain the discharge gauge pressure at 90 psi (620 kPa) ±5 percent.
8. All discharge valves shall be closed not more rapidly than in 3 seconds and not more slowly than in 10 seconds.
9. The rise in discharge pressure shall not exceed 30 psi (200 kPa) and shall be recorded.
10. The pump shall be operated at draft, pumping 50 percent of rated capacity at a discharge gauge pressure of 250 psi (1700 kPa).
11. The pressure control system shall be set in accordance with the manufacturer's instructions to maintain the discharge gauge pressure at 250 psi (1700 kPa) ±5 percent.
12. All discharge valves shall be closed not more rapidly than in 3 seconds and not more slowly than in 10 seconds.
13. The rise in discharge pressure shall not exceed 30 psi (200 kPa) and shall be recorded.

If the pump is rated at greater than 3000 gpm (12,000 L/min), the pressure control system on the pump shall be tested as follows:

1. The pump shall be operated at draft, delivering rated capacity at a discharge gauge pressure of 100 psi (700 kPa).
2. The pressure control system shall be set in accordance with the manufacturer's instructions to maintain the discharge gauge pressure at 100 psi (700 kPa) ±5 percent.
3. All discharge valves shall be closed not more rapidly than in 3 seconds and not more slowly than in 10 seconds.
The rise in discharge pressure shall not exceed 30 psi (200 kPa) and shall be recorded.

The original conditions of pumping rated capacity at a discharge gauge pressure of 150 psi (1000 kPa) shall be reestablished.

The pump shall be operated at draft, pumping 50 percent of rated capacity at a discharge gauge pressure of 200 psi (1400 kPa).

The pressure control system shall be set according to the manufacturer’s instructions to maintain the discharge gauge pressure at 200 psi (1400 kPa) ±5 percent.

All discharge valves shall be closed not more rapidly than in 3 seconds and not more slowly than in 10 seconds.

The rise in discharge pressure shall not exceed 30 psi (200 kPa) and shall be recorded.

**Priming System Tests:**

With the apparatus set up for the pumping test, the primer shall be operated in accordance with the manufacturer’s instructions until the pump has been primed and is discharging water. This test shall be permitted to be performed in connection with priming the pump for the pumping test.

The interval from the time the primer is started until the time the pump is discharging water shall be noted. The time required to prime the pump shall not exceed 30 seconds if the rated capacity is 1250 gpm (5000 L/min) or less. The time required to prime the pump shall not exceed 45 seconds if the rated capacity is 1500 gpm (6000 L/min) or more.

An additional 15 seconds shall be permitted in order to meet the requirements of 16.13.5.3 and 16.13.5.4 when the pump system includes an auxiliary 4 inches (100 mm) or larger intake pipe having a volume of 1 foot³ (0.30 m³) or more.

**Vacuum Test:**

The vacuum test shall consist of subjecting the interior of the pump, with all intake valves open, capped or plugged, and all discharge caps removed, to a vacuum of 22 inches/Hg (75 kPa) by means of the pump priming system.

At altitudes above 2000 feet (600 m), the vacuum attained shall be permitted to be less than 22 inches/Hg (75 kPa) by 1 inch/Hg (3.4 kPa) for each 1000 feet (305 m) of altitude above 2000 feet (610 m).

The vacuum shall not drop more than 10 inches/Hg (34 kPa) in 5 minutes.

The primer shall not be used after the 5 minute test period has begun and the engine shall not be operated at any speed greater than the governed speed during this test.

**Water Tank–to–Pump Flow Test:**

A water tank–to–pump flow test shall be conducted as follows:

1. The water tank shall be filled until it overflows.
2. All intakes to the pump shall be closed.
3. The tank fill line and bypass cooling line shall be closed.
4. Hose lines and nozzles for discharging water at the rated tank-to-pump flow rate shall be connected to one or more discharge outlets.
5. The tank-to-pump valve(s) and the discharge valves leading to the hose lines and nozzles shall be fully opened.
6. The engine throttle shall be adjusted until the required flow rate −0/+5 percent is established.
7. The discharge pressure shall be recorded.
8. The discharge valves shall be closed and the water tank refilled.
(9) The bypass line shall be permitted to be opened temporarily, if needed, to keep the water temperature in the pump within acceptable limits.

(10) The discharge valves shall be reopened fully and the time noted.

(11) If necessary, the engine throttle shall be adjusted to maintain the discharge pressure recorded as noted in 16.13.7.1(7).

(12) When the discharge pressure drops by 10 psi (70 kPa) or more, the time shall be noted and the elapsed time from the opening of the discharge valves shall be calculated and recorded.

**Volume Discharge Calculation:**

The volume discharged shall be calculated by multiplying the rate of discharge in gallons per minute (liters per minute) by the time in minutes elapsed from the opening of the discharge valves until the discharge pressure drops by at least 10 psi (70 kPa).

Other means shall be permitted to be used to determine the volume of water pumped from the tank such as a totalizing flowmeter, weighing the truck before and after, or refilling the tank using a totalizing flowmeter.

The rated tank-to-pump flow rate shall be maintained until 80 percent of the rated capacity of the tank has been discharge.

**Engine Speed Advancement Interlock Test**

The engine speed advancement interlock system shall be tested to verify that engine speed cannot be increased at the pump operator’s panel unless there is throttle-ready indication.

If the apparatus is equipped with a stationary pump driven through split-shaft PTO, the test shall verify that the engine speed control at pump operator’s panel cannot be advanced when either of the following conditions exists:

(6) The chassis transmission is in neutral, the parking brake is off, and the pump shift in the driving compartment is in the road position.

(7) The chassis transmission has been placed in the position for pumping as indicated on the label provided in the driving compartment, the parking brake is on, and the pump shift in the driving compartment is in the road position.

If the apparatus is equipped with a stationary pump driven through a transmission mounted PTO, front-of-engine crankshaft PTO, or engine flywheel PTO, the test shall verify that the engine speed control on the pump operator’s panel cannot be advanced when either of the following conditions exists:

(1) The chassis transmission is in neutral, the parking brake is off, and the pump shift status in the driving compartment is disengaged.

(2) The chassis transmission is in any other gear other than neutral, the parking brake is on, and the pump shift in the driving compartment is in the “Pump Engaged” position.

If the apparatus is equipped with a pump driven by the chassis engine designed for both stationary pumping and pump-in-motion, the test shall verify that the engine speed control at pump operator’s panel cannot be advanced when either of the following conditions exists:

(1) The chassis transmission is in neutral, the parking brake is on, and the pump shift status in the driving compartment is disengaged.

(2) The chassis transmission is in any other gear other than neutral, the parking brake is on, and the pump shift in the driving compartment is in the “Pump Engaged” or the “OK to Pump In-Motion” position.

If the apparatus is equipped with a stationary pump driven through transfer case PTO, the test shall verify that the engine speed control on the pump operator’s panel cannot be advanced when either of the following conditions exists:

(1) The chassis transmission is in neutral, the transfer case is in neutral, the parking brake is off, and the pump shift in the driving compartment is in the road position.
(2) The chassis transmission is in neutral, the transfer case is engaged, the parking brake is off, and the pump shift in the driving compartment is in the road position.

(3) The chassis transmission has been placed in the position for pumping as indicated on the label provided in the driving compartment, the parking brake is on, and the pump shift in the driving compartment is in the road position.

**LOW-VOLTAGE ELECTRICAL SYSTEM PERFORMANCE TESTING**

The apparatus low-voltage electrical system will be tested and certified. Tests shall be performed when the air temperature is between 0 degrees Fahrenheit and 110 degrees Fahrenheit (−18 degrees Celsius and 43 degrees Celsius). The three tests defined in NFPA shall be performed in the order in which they appear. Before each test, the batteries shall be fully charged until the voltage stabilizes at the voltage regulator set point and the lowest charge current is maintained for 10 minutes. Failure of any of these tests shall require a repeat of the sequence.

**Reserve Capacity Test:**

The engine shall be started and kept running until the engine and engine compartment temperatures are stabilized at normal operating temperatures and the battery system is fully charged.

The engine shall be shut off and the minimum continuous electrical load shall be activated for 10 minutes.

All electrical loads shall be turned off prior to attempting to restart the engine. The battery system shall then be capable of restarting the engine. Failure to restart the engine shall be considered a test failure of the battery system.

**Alternator Performance Test at Idle:**

The minimum continuous electrical load shall be activated with the engine running at idle speed.

The engine temperature shall be stabilized at normal operating temperature.

The battery system shall be tested to detect the presence of battery discharge current. The detection of battery discharge current shall be considered a test failure.

**Alternator Performance Test at Full Load:**

The total continuous electrical load shall be activated with the engine running up to the engine manufacturer's governed speed.

The test duration shall be a minimum of 2 hours.

Activation of the load management system shall be permitted during this test.

An alarm sounded by excessive battery discharge, as detected by the system required in NFPA 13.3.4, or a system voltage of less than 11.8 V dc for a 12 V nominal system or 23.6 V dc for a 24 V nominal system, for more than 120 seconds, shall be considered a test failure.

**Low Voltage Alarm Test:**

Following the above test, a Low Voltage Alarm Test will be performed in the manner prescribed.

With the engine shut off, the total continuous electrical load shall be activated and shall continue to be applied until the excessive battery discharge alarm activates.

The battery voltage shall be measured at the battery terminals.

The test shall be considered a failure if the alarm has not yet sounded 140 seconds after the voltage drops to 11.70V for a 12 V nominal system or 23.4 V for a 24 V nominal system.

The battery system shall then be able to restart the engine. Failure to restart the engine shall be considered a test failure.

Factory Pre-construction Conference with Factory Personnel

FACTORY PRE-CONSTRUCTION CONFERENCE

Y___N___
The factory authorized Distributor shall be required, prior to manufacturing, to have a pre-construction conference at the manufacturing facility with a factory representative present and with One (1) individual(s) from the County to finalize all construction details.

The factories authorized distributor shall, at his expense, provide transportation, lodging, and meals. Any distance greater than 200 miles shall be by commercial air travel.

**Final Inspection**

Y___N___

**FINAL INSPECTION CONFERENCE**

The factory authorized Distributor shall be required, during manufacturing, to have a final completion inspection conference at the site of the manufacturing facility with One (1) individuals from the County to inspect the apparatus after construction.

The factories authorized distributor shall, at his expense, provide transportation, lodging, and meals. Any distance greater than 200 miles shall be by commercial air travel.

**NO Maximum Overall Length Requirement (Max OAL)**

Y___N___

**MAXIMUM OVERALL LENGTH REQUIREMENT**

The apparatus specified shall be constructed with no restrictions to the maximum overall length.

**NO Maximum Overall Height Requirement (Max OAH)**

Y___N___

**MAXIMUM OVERALL HEIGHT REQUIREMENT**

The apparatus specified shall be constructed with no restrictions to the maximum overall height.

**Maximum Overall Width, (OAW) = 99” (Apparatus Body)**

Y___N___

**MAXIMUM OVERALL WIDTH OF NINETY-NINE (99) INCHES**

The apparatus specified shall be constructed as detailed and shall NOT exceed a Maximum Overall Width of Ninety-nine (99.00) inches.

This dimension shall include the primary construction of the apparatus body and chassis cab. Any peripheral items shall not be incorporated into this measurement.

The items included, but not limited to, are: Rub Rails, Fenderettes, Mirrors, Lights, Handrails, Front Bumpers, Cab Steps, Overlays, Etc.

**NO Maximum Wheel Base**

Y___N___

**MAXIMUM WHEEL BASE REQUIREMENT**

The apparatus specified shall be constructed with no restrictions to the maximum wheel base.

**Exhaust Heat Shield, Front Compartment**

Y___N___

**EXHAUST HEAT SHIELD**

There shall be an exhaust heat shield added to the chassis provided exhaust. The shield shall terminate past the front compartment and shall incorporate a heavy duty spray on insulation under R1. With this shield, the temperature of the front compartment shall not exceed the ambient temperature.

The heat shield shall be attached to the underside of the body utilizing a flexible bracket.

**Chassis Required Labeling & Miscellaneous Options, English, custom cab**

Y___N___

**CHASSIS REQUIRED LABELING**

Signs that state “Occupants must be seated and belted when apparatus is in motion” shall be provided.

They shall be visible from each seating position.

There shall be a lubrication plate mounted inside the cab listing the type and grade of lubrication used in the following areas on the apparatus and chassis:
- Engine oil
- Engine Coolant
- Transmission Fluid
- Pump Transmission Lubrication Fluid
- Drive Axle Lubrication Fluid
- Generator Lubrication Fluid (where applicable)
- Tire Pressures

Apparatus Information Label-English

**APPARATUS INFORMATION LABEL**

There shall be a high-visibility label installed in a location clearly detectable to the driver while in the seated position.

The label shall indicate the following specified information.

- Overall Height (feet and inches)
- Overall Length (feet and inches)
- Overall GVWR (tons or metric tons)

**CAB TILT CONTROL**

There shall be a cab tilt pendant control provided and installed on the right side of the apparatus. The pendant shall be located directly behind the upper auxiliary pump access panel.

There shall also be a cab tilt instruction plate located as close as possible to the control pendant for ease of operation.

**HEAT EXCHANGER**

The supplementary heat exchanger cooling system shall be provided and installed to the discharge side of the fire pump through to the engine compartment without intermixing, for absorption of excess heat.

The heat exchanger shall be adequate in size to maintain safe operating temperature of the coolant in the pump drive engine and not in excess of the engine manufacturer's temperature rating, under all pumping conditions. Appropriate drains shall be provided to allow draining the heat exchanger to prevent damage from freezing.

**HELMET RESTRAINTS**

Four (4) Ziamatic UHH-1 Universal Helmet Holders shall be provided and shipped loose with the apparatus.

**MUD FLAPS**

Heavy-duty black rubber mud flaps with manufactures logo shall be provided behind the rear wheels. The mud flaps shall be bolted in place.

**PUMP COMPARTMENT**

The complete apparatus pump compartment shall be constructed of a combination of structural tubing and formed sheet metal. The same materials used in the body shall be utilized in the construction of the pump compartment. The structure shall be welded utilizing the same A.W.S. Certified welding procedure as used on the structural body module. These processes shall ensure the quality of structural stability of the pump compartment module.

The pump compartment module shall be separated from the apparatus body with a gap. This gap is necessary to accommodate the flexing of the chassis frame rails that are encountered while the vehicle is in transit so that harmful torsional forces are not transmitted into the structural framework.
VIBRA-TORQUE™ PUMP MODULE MOUNTING SYSTEM

The entire pump module assembly shall be mounted so that it “floats” above the chassis frame rails exclusively with Vibra-Torq™ torsion isolator assemblies to reduce the vibration and stress providing an extremely durable pump module mounting system.

The pump module substructure shall be mounted above the frame to allow independent flexing to occur between the body and the chassis. Each assembly shall be mounted to the chassis frame rails with steel, gusseted mounting brackets. Each bracket shall be powder coated for corrosion resistance. Each pump compartment mount bracket shall be mounted to the side chassis frame flange with two 5/8”-UNC Grade 5 HHCS.

Each assembly shall have a two-part rubber vibration isolator. The isolator shall be of a specific durometer to carry the necessary loads of the pump module, apparatus body, equipment, tank, water, and hose. The quantity of mounts utilized shall correspond directly to the anticipated weight being supported. Certain assemblies shall also incorporate a torsion spring. Helical coil springs shall be incorporated into specific mounts in tandem with the rubber isolators to minimize the stress absorbed by the body caused from chassis frame rail flexing.

There shall be no welding to the chassis frame rail sides, web or flanges, or drilling of holes in the top or bottom frame flanges between axles. All pump module to chassis connections shall be bolted so that in the event of an accident, the body shall be easily removable from the truck chassis for repair or replacement.

Because of the constant vibration and twisting action that occurs in chassis frame rails and suspension, the torsion mounting system is required to minimize the possibility of premature pump module structural failures. The Vibra-Torque™ mounting system shall have a lifetime warranty. NO EXCEPTIONS

(1) Pump Compartment Work Light, (Weldon LED) Y___N___
PUMP COMPARTMENT WORK LIGHT

One (1) Weldon LED work light model #2631-0000-30 shall be installed in the pump compartment module to illuminate the piping and plumbing components.

The light shall be activated by a weather resistant toggle switch installed inside the pump compartment.

Top Operator's Panel Y___N___
OPERATORS PANEL

The operators’ panel shall be a "top mount", constructed on two (2) incline surfaces.

The lower panel housing shall be used for valve controls. The upper panel housing shall be used for gauges, pump controls and any other activation controls specified.

The valve control levers shall be immediately adjacent to the respective gauges neatly arranged for easy access and visible for the operator.

Valve Control-Innovative Controls ROUND Handle- Top Mount (Bezels Not Available) Y___N___
VALVE CONTROL – TOP MOUNT ASSEMBLY

Unless specified otherwise, the valves shall be controlled from a top mounted valve control assembly that shall be installed on the specified discharge and suction. The Innovative Control handles shall utilize an extrusion at the panel and shall have an ergonomically designed chrome plated round handle that can be locked and unlocked by rotating the handle clockwise or counterclockwise. The assembly shall have a color coded name plate insertion recess area.

Pnl Lts-TC-Brushed@Top/DP Int Steps@Side w/ Hand Cutouts-Full Length RX Lights Y___N___
PANEL LIGHTS

There shall be adequate illumination provided at the top operator's panel and at the side pump panels.

For the top mount panel there shall be a brushed stainless steel shielded light assembly provided. The shield shall contain one (1) maximum length to fit available LED Tube light model #RX-15T16-5020.

At each side pump panel there shall be a .188 inch (4.76 mm) embossed aluminum diamond plate shielded light assembly functioning as an intermediate step and installed on a stationary surface. There shall be up to three (3) handhold cutouts
provided in the top step surface measuring approximately 3.00 inches deep. There shall be one (1) full length aluminum non lit handrail integrated into each side assembly.

Each side shield shall contain the maximum number of lights permitted in the space available for one (1) full length LED Tube light model #RX-15T16-5020.

**PUMP PANEL LIGHT ACTIVATION**

Pump Panel Light Activation- OK to pump & Pump Panel Switches at side panels-TM  

Y___N___

One (1) pump panel light at the top operator's panel shall be illuminated at the time the pump is ready to pump and it is "OK TO PUMP". The Pump shift has been completed and the chassis automatic transmission is engaged.

The remaining lights shall be controlled by a switch located one (1) each side of the pump compartment.

**PUMP COMPARTMENT SERVICE ACCESS**

Pump Compt Fwd TB Wall-Partial Section Removable for pump access (top ctrl)  

Y___N___

The front portion of the pump compartment structure shall be overlaid with aluminum diamond plate.

A removable aluminum diamond plate panel shall be provided at the front face of the pump compartment for access to the midship pump and plumbing. The panel shall be secured by two (2) push-button latches.

**PUMP COMPARTMENT WIDTH**

The width of the pump compartment (front to back) shall be 48.00 inches (1.21 m).

**ALUMINUM WALKWAY WITH "GRIP STRUT" STEPS**

The walkway shall be located between the cab and pump house where flex joints shall be provided between the walkway and pump compartment as well as between walkway and the chassis cab. These flex joints shall be required to reduce the negative effects that chassis frame rail twist can induce into structural components.

The walkway shall be constructed of aluminum tubing to provide a framework for stepping and standing areas.

For configurations where the gap to the rear of cab exceeds 2.50 inches, a formed channel to be provided to fill in the gap above the frame rail area between the walkway and cab.

Each side of the walkway shall have an intermediate step which facilitates access to the walkway standing surface from the running board level. The surface of the walkway, intermediate steps, and running board areas of the walkway shall be constructed of an aggressive aluminum "Grip Strut" extrusion.

The running board stepping surface shall be flush with the top of the supportive tubular framework.

**WALKWAY STEP LIGHTING**

(1) LED Walkway Tube Lighting-At Each Secondary Step  

Y___N___

The secondary walkway step area shall be illuminated with one (1) LED Tube light model #RX-15T16-5050-21CM surface mounted and installed on each side of the walkway with a chrome bezel.

**WALKWAY LIGHTING ACTIVATION**

Walkway Light Activation - Panel Lights  

Y___N___

The walkway step lights shall be activated with the pump panel lights.

**WALKWAY WIDTH**

Walkway - 27"  

Y___N___

The walkway area immediately forward of the pump compartment shall be approximately 27.00 inches in width.

(2) LED Walkway Tube Lighting-Mnt to pump compt  

Y___N___
WALKWAY LIGHTING

The pump operator's walkway area shall be illuminated with two (2) LED Tube lights model #RX-15T16-5050-21CM with an aluminum bezel. The lights shall be surface mounted and installed on the forward face of the pump compartment.

Walkway Light Activation - Panel Lights

WALKWAY LIGHTING ACTIVATION

The walkway step lights shall be activated with the pump panel lights.

(2) 18” Handrails, knurled SSTL - Top Mount Pump House

18” HANDRAILS

All handrails shall be 1.25 inches in diameter constructed of knurled #3 polished stainless steel tubing. There shall be a minimum of 2.00 inches of clearance between the bracket and the body.

Two (2) 18.00 inch handrails shall be installed on the pump compartment, one (1) each side near the walkway steps to facilitate access up to the operator's panel area.

Top panel to be Brushed Stainless

BRUSHED STAINLESS STEEL TOP CONTROL PANEL

The surface of the operator's control and gauge panel shall be manufactured from heavy duty "Brushed Stainless Steel", that is capable of withstanding the effects of extreme weather and temperature.

Side Panels Split - Removable (L&R sides)  (Brushed Stainless)

REMOVABLE RIGHT & LEFT SIDE PUMP PANELS

There shall be two (2) side pump panels on each side of the pump compartment, one (1) upper and one (1) lower. Each panel shall be accessible by quick-release type latches, closing against a door seal. The panels shall be easily removed for a large access to the pump for service.

RIGHT & LEFT SIDE BRUSHED STAINLESS STEEL FINISHING FOR PANELS AND OVERLAYS

All panels shall be made from 14 gauge "Brushed Stainless Steel" capable of withstanding the effects of extreme weather and temperature.

The tubular structure shall be overlaid on each side of the pump compartment underneath the access panels and shall be made of "Brushed Stainless Steel".

Running Board Details, Pumper/Tanker

RUNNING BOARDS

The pump compartment running boards shall be made of a structural tubular framework. The tubular frame support all loads by transmitting the loads through the pump compartment structure directly to the chassis frame rails.

The running boards shall be independent of the apparatus body and shall be integrated to the pump compartment structure only, eliminating any pump compartment to body interference. This is essential in keeping a truly 'modular' configuration. Slip-resistant abrasive adhesive materials shall be applied to the top surface of the running board framework to provide a suitable stepping surface where applicable.

3/16” Embossed Aluminum Diamond Plate Overlay (use drop down for hose well pkg)

EMBOSSED ALUMINUM DIAMOND PLATE OVERLAYS

The side running boards shall have a .188 inch (4.76 mm) embossed aluminum diamond plate overlays installed. The stepping areas shall be as large as possible, overlapping the perimeter of the running board structure.

IC Apparatus Labeling - Deluxe Labels, Top Mount

APPARATUS PLUMBING LABELING

Innovative Controls verbiage tag bezels shall be installed where applicable for components specified. The bezel assemblies will be used to identify apparatus components. These tags shall be designed and manufactured to withstand
the specified apparatus service environment and shall be backed by a warranty equal to that of the exterior paint and finish. The verbiage tag bezel assemblies shall include a chrome-plated panel-mount bezel with durable easy-to-read UV resistant polycarbonate inserts featuring the specified verbiage and color coding. These UV resistant polycarbonate verbiage and color inserts shall be subsurface screen printed to eliminate the possibility of wear and protect the inks from fading. Both the insert labels and bezel shall be backed with 3M permanent adhesive, which meets UL969 and NFPA standards.

**Pressure Governor (CHASSIS provided governor-MUST SELECT IN SPARCON)** Y N

**PRESSURE GOVERNOR**

The Pressure Governing System provided with the chassis shall be installed on the pump operator's panel.

Intake Pressure Relief - TFT, All Pumps Y N

**PRESSURE RELIEF VALVE**

A Task Force Tips model #A18XX pressure relief valve shall be provided. The valve shall have an easy to read adjustment range from 90 to 300 PSI with easy to read 90, 125, 150, 200, 250, 300 psi settings and an “OFF” position. Pressure adjustment can be made utilizing a ¼” hex key, 9/16” socket or 14mm socket.

For corrosion resistance the cast aluminum valve shall be a hardcoat anodized with a powder coat interior and exterior finish. The valve shall meet (NFPA) 1901, Standard for Automotive Fire Apparatus, requirements for pump inlet relief valves. The unit shall be covered by a five year warranty. The valve shall be preset at 125 PSI (860 kPa) suction inlet pressure, unless otherwise shop noted. The valve shall be installed inside the pump compartment where it will be easily accessible for future adjustment. The excess water shall be plumbed to the atmosphere and shall dump on the opposite side of the pump operator.

For normal pumping operations, the relief valve shall not be capped and there shall be a placard stating "DO NOT CAP" installed.

NOSHOK/IC BRASS 4" Master Gauges Y N

**MASTER GAUGES**

NOSHOK 4.00 inch (100 mm) gauges with a brass case shall be supplied for the master intake and master discharge gauges. The gauges shall have an orange indicating pointer for increased visibility.

-30 to 400 PSI Scale Reading-Gauge Y N

**GAUGE SCALE**

The master intake gauge shall be marked for a reading from -30 to 400 PSI and the master discharge shall be marked for reading a discharge pressure of 0 to 400 PSI.

Black Markings on white gauge face Y N

**GAUGE FACE COLOR**

Each gauge shall have black markings on a white face.

Pump Testing Ports Y N

**TESTING PORTS**

Test port connections for pressure and vacuum shall be provided at the pump operator's panel. One (1) shall be connected to the intake side of the pump, and the other to the discharge manifold side of the pump.

Each port shall have 0.25 inch (6.35 mm) standard pipe thread connection and be manufactured of non-corrosive polished stainless steel or brass plugs.

IC 16 Light Tank Gauge - operator's panel Y N

**WATER TANK LEVEL GAUGE**

One (1) Innovative Controls SL Plus Tank Level Monitor System shall be provided on the pump operator's control panel. The system shall include one (1) electronic display module, a stainless steel pressure transducer sending unit, and wiring with water-tight plug terminations not requiring sealing grease. The display shall include a decorative chrome-plated panel-mounting bezel.
The master display module shall show the tank level using 16 super-bright easy-to-see LEDs. Tank level indication shall be achieved by the appropriate illumination of 4 horizontal rows of LEDs, with 4 LEDs per row. Full and near-full levels shall be indicated by the illumination of all 4 rows of LEDs, tank levels between 1/2 and 3/4 full shall be indicated by the illumination of the bottom 3 rows of LEDs, tank levels between 1/4 and 1/2 full shall be indicated by the illumination of the bottom 2 rows of LEDs, and tank levels between 1/4 full and near empty shall be indicated by the illumination of the bottom row of 4 red LEDs only. Tank levels between near empty and empty shall be indicated by flashing the bottom row of 4 red LEDs.

The master display shall have a backlit area at the top with an illuminated water icon.

**Chassis Includes (2) Water Gauges-NO Driver Needed**

**CHASSIS INSTALLED TANK LEVEL GAUGE**

The chassis shall include two (2) tank level gauges installed.

**Air Horn Button-Red Push Button**

**AIR HORN BUTTON**

There shall be an air horn activation red push button provided and installed on the pump operator's gauge panel. The air horn button shall be of weather resistance type and labeled "AIR HORN".

**Pump Compartment Top - (NO DUNNAGE) 1/8" Embossed Aluminum Diamond Plate Surface**

**PUMP COMPARTMENT TOP OVERLAY**

The top of the pump compartment shall be overlaid with 1/8" embossed aluminum diamond plate.

**Pump Compartment External Horizontal Upper Storage-Smooth Finish Interior**

**PUMP COMPARTMENT UPPER STORAGE AREA**

There shall be a transverse storage compartment provided and installed on top of the pump compartment module.

The compartment shall be constructed of .125 inch (3.18 mm) smooth aluminum and allow access through either side.

The interior shall be designed as transverse with the compartment floor lined with black ABS plastic for ease of stowing and un-stowing of equipment.

The compartment shall include provisions for storing the following equipment:

**Compartment to Hold (2) Backboards, horizontal storage**

Individual storage slots for two (2) Backboards.

The slots shall have clear inside dimensions of approximately 2.50 inches (63.50 mm) high by 18.00 inches (457.20 mm) wide.

Each backboard shall be removable without disturbing the storage of another.

**Pump Compartment Upper Storage-Horizontal Door-Push Button-Diamond Plate**

**PUMP COMPARTMENT UPPER STORAGE DOORS**

The upper storage shall include horizontally hinged flat panel doors secured with two (2) push button latches. Each door shall be fabricated of .125 inch (3.18 mm) aluminum diamond plate.

If the door is not properly closed and the parking brake is released, it shall activate the hazard light in the cab to alert the crew.

**Waterous Pump, CSU 1250 GPM (s/s)**

**MIDSHIP PUMP**

The pump shall have a capacity of 1250 gallons per minute, measured in U.S. Gallons. The pump shall be a Waterous model CSU, single stage midship pump.
The pumps impellers shall be bronze with double suction inlets, accurately balanced (mechanically and hydraulically), of mixed flow design with reverse-flow, labyrinth-type, wear rings that resist water bypass and loss of efficiency due to wear. The impeller shall have flame plated hub to assure maximum pump life and efficiency despite the presence of abrasive particles, such as fine sand, in the water being pumped. The wear rings shall be bronze and easily replaceable to restore original pump efficiency and eliminate the need for replacing the entire pump casing due to wear.

Pump casing shall be close grained gray iron, bronze fitted and horizontally split in two sections for easy removal of entire impeller assembly, including wear rings, without disturbing setting of pump in chassis or pump piping. The pump, for ease and rapid servicing in the future, shall have the separable impeller shaft which allows true separation of transmission or pump without disassembly or disturbing the other component. This shall be accomplished by using a two piece shaft. This feature will allow field service to accomplish in much less time since each component (pump or transmission) can be repaired independently. The impeller shaft shall be stainless steel, accurately ground to size and polished. Shaft shall be supported at each end by ball type oil grease lubricated bearings. Sleeve bearings or bushings will not be acceptable. The bearings shall be protected from water at each end of the impeller shaft.

The discharge manifold shall be cast as an integral part of the pump body assembly and shall provide at least three full 3.50 inch openings for ultimate flexibility in providing various discharge outlets for maximum efficiency, and shall be located as follows: one outlet on the right side of the pump body, one outlet on the left side of the pump body, and one outlet directly on top of the pump discharge manifold.

The entire pump shall be cast, manufactured and tested at the pump manufacturer's factory. The pump transmission housing shall be high strength aluminum, three pieces and horizontally split. Power transfer to the pump shall be through a Morse Hy-Vo drive chain. Chain shall be pressure lubricated through oil pump. Chain sprockets shall be cut from carbonized, hardened alloy steel. Spur gears will not be acceptable.

The drive shafts shall be 2.35 inches in diameter, made of hardened and ground alloy steel. All shafts shall be ball bearing supported. Case shall be designed to eliminate the need of water cooling.

The entire pump, both suction and discharge passages, shall be hydrostatically tested to a pressure of 600 PSI. A certificate documenting this test shall be provided with the completed apparatus. The pump shall be fully tested at the pump manufacturer's factory to the performance requirements as outlined by the latest (NFPA) 1901, Standard for Automotive Fire Apparatus. Pump shall be free from objectionable pulsation and vibration.

The pump shall be the Class "A" type and shall deliver the percentage of rated discharge at pressures indicated below.

100% of rated capacity at 150 PSI net pump pressure.
100% of rated capacity at 165 PSI net pump pressure.
70% or rated capacity at 200 PSI net pump pressure.
50% of rated capacity at 250 PSI net pump pressure.

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

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

VPO Rotary Vane Primer-Single Primer Actuation  (oil less-midship only)  Y___N___

The priming system shall include an electrically driven rotary vane priming pump rigidly attached to the pump transmission. The priming pump shall be self-lubricating and shall not require an external oil reservoir. The pump, when dry, shall be capable of taking suction and discharging water with a lift of 10 feet in not more than 30 seconds through 20 feet of suction hose through the steamers. Priming pump shall be built by the manufacturer of the fire pump.

There shall be one (1) push button control to simultaneously actuate the primer control valve and the primer motor at the operator's panel.
6" Inlet LEFT SIDE w/ Short Tube  
**MAIN PUMP INLET-LEFT SIDE**  
Y___N___

A 6.00 inch (150 mm) pump manifold inlet shall be provided on the left side of the pump. The shorter style inlet shall protrude less than 2.00 inches (50 mm) away from the side panel, allowing an external valve to be connected and not protrude past the apparatus body sides while maintaining a low connection height.

The main pump inlet shall have National Standard Threads and includes a removable screen designed to provide cathodic protection for reducing deterioration in the pump.

(1) TFT 6"NST x 5" Storz 30 degree Jumbo BIV w/Cap  
**HIGH FLOW BALL INTAKE VALVE**

There shall be one (1) Task Force Tips (TFT) model #AX3ST-NX 6.00 inch (150 mm) NST x 5.00 inch (125 mm) Storz 30 degree Jumbo Ball Intake Valve (BIV) installed on the steamer inlet.

The valve shall be equipped with an adjustable pressure relief valve under the main valve body with an eight position adjustable inlet elbow. The valve shall be controlled with an NFPA compliant slow-close hand wheel gear operator which can be configured for left or right hand operation. A .75 inch (19.05 mm) bleeder valve shall be provided to exhaust excess air or water from the valve and hose line. A position indicator shall be provided to allow for quick visualization of the status of the valve in the open, closed or partial positions. For maximum corrosion protection the aluminum casting shall be hardcoat anodized, with a powder coat internal and external finish and all components facing the wet side of the valve shall be constructed from stainless steel.

The jumbo ball intake valve shall have a free swiveling 5.00 inch (125 mm) Storz connection with an A01ST 5.00 inch (125 mm) Storz cap provided.

6" Inlet RIGHT SIDE w/ Short Tube  
**MAIN PUMP INLET-RIGHT SIDE**  
Y___N___

A 6.00 inch (150 mm) pump manifold inlet shall be provided on the right side of the pump. The shorter style inlet shall protrude less than 2.00 inches (50 mm) away from the side panel, allowing an external valve to be connected and not protrude past the apparatus body sides while maintaining a low connection height.

The main pump inlet shall have National Standard Threads and includes a removable screen designed to provide cathodic protection for reducing deterioration in the pump.

6"NSTFS x 5" Storz Elbow, Cap, Chain  
**5" STORZ ELBOW & CAP**

The inlet shall include the following components:

One (1) 6.00 inch (150 mm) NST female swivel x 5.00 inch (125 mm) Storz cast aluminum elbow

One (1) 5.00 inch (125 mm) Storz cap

**MASTER DRAIN VALVE**

A Trident manifold type drain valve shall be installed in the pump compartment. All pump drains shall be connected to the master drain valve. The drain valve shall be controlled from the left side lower pump house sill. The control shall be a hand wheel knob marked “open” and “closed”.

The drain shall be located such that it shall not interfere with pumping operations or function such as soft suction hoses, etc. nor shall it protrude past the outer edge of the apparatus, to prevent damage to the valve.

In some cases, it is necessary to locate the master drain in a secondary location to ensure proper draining. If no lower or vertical sill exists, the drain shall be located below the bottom outside edge of the hose body near the forward most corner on the driver’s side hose body. The drain shall not protrude past the outer edge of the body, thus preventing damage to the valve.
Pump Cooling/Circulation Line

**PUMP COOLING LINE**

Y___N___

There shall be a .38 inch (9.5 mm) line running from the pump to the water tank to assist in keeping the pump water from overheating. A valve shall be installed on the operator's panel.

(Qty 2) Pump Anodes - discharge and suction

**PUMP ANODES**

Y___N___

Two (2) pump anodes shall be installed in the pumping system, one (1) on the discharge side and one (1) on the suction side, to prevent damage from galvanic corrosion within the pump system.

Plumbing Specs - Sch 10 Stainless Steel, -Pumper, Tanker- 3” manifold

**STAINLESS STEEL PLUMBING**

Y___N___

All auxiliary suction and discharge plumbing related fittings, and manifolds shall be fabricated with a minimum of 3.00 inch (77 mm), or greater as required by design, schedule 10 stainless steel pipe; brass or high pressure flexible piping with stainless steel couplings. NO EXCEPTIONS  Galvanized components and/or iron pipe shall NOT be accepted to ensure long life of the plumbing system without corrosion or deterioration of the waterway system. Where waterway transitions are critical (elbows, tees, etc.), no threaded fittings shall be allowed to promote the smooth transition of water flow to minimize friction loss and turbulence. All piping components and valves shall be non-painted, unless otherwise specified. All piping welds shall be wire brushed and cleaned for inspection and appearance.

The high pressure flexible piping shall be black SBR synthetic rubber hose with 300 PSI working pressure and 1200 PSI burst pressure for flexible piping sizes 1.50 inches (38 mm) through 4.00 inches (100 mm). Sizes .75 inch (19 mm), 1.00 inch (25 mm) and 5.00 inches (125 mm) are rated at 250 PSI working pressure and 1000 PSI burst pressure. All sizes are rated at 30 in HG vacuum. Reinforcement consists of two plies of high tensile strength tire cord for all sizes and helix wire installed in sizes 1.00 inch (25 mm) through 5.00 inches (125 mm) for maximum performance in tight bend applications. The material has a temperature rating of -40 degrees Fahrenheit to +210 degrees Fahrenheit.

The stainless steel full flow couplings are precision machined from high tensile strength stainless steel. All female couplings are brass. Mechanical grooved and male .75 inch (19 mm) and 1.00 inch (25 mm) couplings are brass. A high tensile strength stainless steel ferrule with serrations on the I.D. is utilized to assure maximum holding power when fastening couplings to hose.

Plumbing Line Protection

**PUMP HOUSE LINE PROTECTION**

Y___N___

All drain lines for the discharges, suction, ABS discharge gauge lines and any other appropriate connections in the pump house area shall have a protective cover provided on the lines in the required areas of the lines to prevent the lines from rubbing on any other components in the pump house area.

All drain lines, ABS lines, high pressure discharge lines and electrical wiring in the pump house area shall be properly and neatly routed, wire tied and rubber coated “P” clamped, to keep the items secured.

Manual Drains Innovative Controls Lift Handle- {New}

**DRAIN VALVES**

Y___N___

An Innovative Controls 3/4" quarter turn drain valve shall be included on each discharge, gated intake, and steamer valve (if applicable). A side stem, long stroke chrome plated lift handle shall be provided on the drain valve to facilitate use with a gloved hand. The drain valve shall have an ergonomically designed handle with a recessed verbiage tag area easily read by the operator before opening.

The drain valve shall be connected to the valve with a flexible hose that is routed in such a manner as to assure complete drainage to below the apparatus.

2.5 - 3” Left Side Inlet

**LEFT SIDE INLET**

Y___N___

There shall be one (1) gated suction inlet with .75 inch (19mm) bleeder installed on the left side of the apparatus with the following specified components.
Akron 8000 Series Valve - 2.5"

**INTAKE VALVE**

A 2.50 inch (65 mm) Akron Brass 8000 series swing-out valve with stainless steel ball.

Valve(s) Controlled - Operator’s Panel - (See Eng Note)  

**INTAKE VALVE CONTROL**

The intake valve shall be controlled from the pump operator’s panel location.

2.5" Side Inlet Piping  

**INTAKE PLUMBING**

The plumbing shall consist of 2.50 inch (65 mm) piping, and shall incorporate a manual drain control installed below the pump area for ease of access.

Term: 2.5" NPT x 2.5" NST adapt w/Plug  

**SUCTION/INTAKE TERMINATION**

The termination shall include the following components:

- One (1) 2.50 inch (65 mm) NST swivel female straight adapter with screen
- One (1) 2.50 inch (65 mm) self-venting plug, secured by a chain

Side Inlet to be located in forward position  

**INLET LOCATION**

The inlet shall be located on the pump panel in the forward position.

(Qty 2) 2.5" - 3" Left Side Discharges  

**LEFT SIDE DISCHARGE**

There shall be two (2) gated discharges installed on the left side of the apparatus with the following specified components.

Akron 8000 Series Valve - 2 1/2"

**DISCHARGE VALVE**

A 2.50 inch (65 mm) Akron Brass 8000 series swing-out valve with a stainless steel ball.

Valve(s) Controlled - Direct Discharge Valve w/ Lever - (Watch top mounts)  

**DISCHARGE VALVE CONTROL**

The control valve shall be a ‘swing out type’ direct operation manual lever actuator at the valve.

2 1/2" Discharge Piping (side discharges)  

**DISCHARGE PLUMBING**

The plumbing shall consist of 2.50 inch (65 mm) piping, and shall incorporate a manual drain control installed below the pump area for ease of access.

Term: 2.5" NST x 2.5"NST x 2.5"NST Chrome Elbw w/cap  

**DISCHARGE TERMINATION**

The discharge termination shall include the following components:

- One (1) 2.50 inch (65 mm) Male NST adapter
- One (1) 2.50 inch (65 mm) NST female swivel by male with 45 degree polished elbow
- One (1) 2.50 inch (65 mm) female self-venting cap, secured by a chain
RIGHT SIDE DISCHARGE

There shall be one (1) gated discharge installed on the right side of the apparatus with the following specified components.

Akron 8000 Series Valve - 2 1/2" Y___N___

**DISCHARGE VALVE**

A 2.50 inch (65 mm) Akron Brass 8000 series swing-out valve with a stainless steel ball.

Valve(s) Controlled -Operator's Panel- Y___N___

**DISCHARGE VALVE CONTROL**

The discharge shall be controlled from the pump operator's panel location.

2 1/2" Discharge Piping (side discharges) Y___N___

**DISCHARGE PLUMBING**

The plumbing shall consist of 2.50 inch (65 mm) piping, and shall incorporate a manual drain control installed below the pump area for ease of access.

Term: 2.5" NST x 2.5"NST x 2.5"NST Chrome Elbw w/cap Y___N___

**DISCHARGE TERMINATION**

The discharge termination shall include the following components:

One (1) 2.50 inch (65 mm) Male NST adapter

One (1) 2.50 inch (65 mm) NST female swivel by male with 45 degree polished elbow

One (1) 2.50 inch (65 mm) female self-venting cap, secured by a chain

RIGHT SIDE MASTER DISCHARGE

There shall be one (1) master discharge installed on the right side of the apparatus provided with the following specified components.

Akron 8000 Series Valve - 3" Y___N___

**DISCHARGE VALVE**

A 3.00 inch (77 mm) Akron Brass 8000 series slo-cloz swing-out valve with a stainless steel ball.

Valve(s) Controlled -Operator's Panel- Y___N___

**DISCHARGE VALVE CONTROL**

The discharge shall be controlled from the pump operator's panel location.

3" Discharge Piping (side mstr) Y___N___

**DISCHARGE PLUMBING**

The plumbing shall consist of 3.00 inch (77 mm) piping, and shall incorporate a manual drain control installed below the pump area for ease of access.

Term: 3" NST x 2.5" NST Elbow w/cap Y___N___

**DISCHARGE TERMINATION**

The discharge termination shall include the following components:

One (1) 3.00 inch (77 mm) male NST adapter
One (1) 3.00 inch (77 mm) NST female by 2.50 inch (65 mm) male with 45 degree elbow

One (1) 2.50 inch (65 mm) female self-venting cap, secured by a chain

2.5" - 3" Right Rear Discharge

**RIGHT REAR DISCHARGE**

There shall be one (1) gated discharge installed on the right rear of the apparatus with the following specified components.

Akron 8000 Series Valve - 2 1/2"

**DISCHARGE VALVE**

A 2.50 inch (65 mm) Akron Brass 8000 series swing-out valve with a stainless steel ball.

Valve(s) Controlled - Operator's Panel-

**DISCHARGE VALVE CONTROL**

The discharge shall be controlled from the pump operator's panel location.

2 1/2" Discharge Plumbing (rear discharges)

**DISCHARGE PLUMBING**

The plumbing shall consist of 2.50 inch (65 mm) piping, and shall incorporate a manual drain control installed below the pump area for ease of access.

Term: 2.5" NST x 2.5"NST x 2.5"NST Chrome Elbw w/cap

**DISCHARGE TERMINATION**

The discharge termination shall include the following components:

One (1) 2.50 inch (65 mm) Male NST adapter

One (1) 2.50 inch (65 mm) NST female swivel by male with 45 degree polished elbow

One (1) 2.50 inch (65 mm) female self-venting cap, secured by a chain

**SPEEDLAY MODULE BEHIND CHASSIS CAB**

An assembly shall be provided for the speedlays that shall be modular and be able to be separated from the walkway if needed. The assembly shall rest on the walkway surface and mount just behind the chassis cab. The entire speedlay assembly shall be fabricated out of embossed aluminum diamond plate. Each speedlay bay shall be separated by a full height smooth aluminum vertical divider with chamfered corners at each end.

The speedlay module shall have a hinged .188 inch embossed aluminum diamond plate top cover used to access the area for hose loading that shall be secured with a mechanical latch mechanism to hold the lid in the closed position. The cover, when opened, shall be held open with a gas shock hold open device and shall rest against rubber bumpers to protect the finish of the chassis cab rear surface. The cover shall also serve as a bench seat for operators or other firefighting personnel at the top control walkway area.

Each chiksan swivel shall be installed just below the floor of each speedlay bed, high enough for hose couplings to be accessed and tightened on to the chiksans. Chiksan swivels shall swing from left to right to allow attached hose to be deployed from either side of the apparatus.

(Qty) Speedlay - 1.75"-200'  

**1 3/4" SPEEDLAY**

A speedlay with the following specified components shall be provided for up to 200 feet (60 m) of 1.75 inch (44.4 mm) hose.

There shall be a total of two (2) provided.
Akron 8000 Series Valve - 2"

**DISCHARGE VALVE**

A 2.00 inch (50 mm) Akron Brass 8000 series swing-out valve with a stainless steel ball.

Valve(s) Controlled - Operator's Panel -

**DISCHARGE VALVE CONTROL**

The discharge shall be controlled from the pump operator's panel location.

2" Discharge Plumbing (x-lays, speedlays, side body preconnects)

**DISCHARGE PLUMBING**

The plumbing shall consist of 2.00 inch (50 mm) piping, and shall incorporate a manual drain control installed below the pump area for ease of access.

Term: 2" NPT x 1.5" NST Brass Chiksan (no cap)

**DISCHARGE TERMINATION**

The discharge termination shall include the following components:

One (1) 2.00 inch (50 mm) NPT x 1.50 inch (38 mm) NST brass chiksan swivel

Brushed Stainless Steel Trim Around Speedlay Opening

**SPEEDLAY TRIM**

Brushed stainless steel trim shall be installed at the openings on each side of the speedlay hose bed area. The trim shall extend 8.00 inches into the speedlay bay opening from the outer edge. The trim shall reduce the chaffing of the hose jacket on the edges of the bay area.

Single-Vinyl Cover for Speedlay Hosebed (Velcro 3 sides w/extrusion)

**SPEEDLAY COVER**

The speedlay hose bed area shall have a single vinyl cover provided and installed for the bay openings on both sides of the apparatus. Each cover shall be held in place by an extrusion at the bottom of each bay and Velcro on the remaining three sides. A nylon strap shall be attached to the top for fast access with a gloved hand.

Speedlay Cover(s) to be Red

**SPEEDLAY COVER COLOR**

The speedlay hose bed covers shall be red in color.

(1) Deluge Waterway (Pumper)

**DECK GUN MONITOR WATERWAY**

There shall be one (1) deck gun monitor waterway installed on the apparatus with the following components.

Akron 8000 Series Valve - 3"

**DISCHARGE VALVE**

A 3.00 inch (77 mm) Akron Brass 8000 series slo-cloz swing-out valve with a stainless steel ball.

Valve(s) Controlled - Operator's Panel -

**DISCHARGE VALVE CONTROL**

The discharge shall be controlled from the pump operator's panel location.

3" Discharge Piping (deluge) (Pumper)

**DELUGE PLUMBING**

The deluge waterway shall consist of 3.00 inch (77 mm) piping and shall be drained with an auto-drain located at the
lowest point of the waterway plumbing if required.

Deluge-locate pipe center location, above pump

**DELUGE PIPE LOCATION**

The deluge pipe shall be located up through the pump compartment, at the center location.

Tele pipe, TFT, Ext-A-Gun, 12", 3" VIC x CrossFire

**TELESCOPING MONITOR PIPE**

One (1) Task Force Tips model #XG12VL-XL manually telescoping waterway shall be provided with the apparatus.

The waterway shall be capable of being lowered to deck level (or into a monitor well) for storage and transportation and shall be capable of being raised to an extended height of 12.00 inch (304.79 mm) by lifting a quick release latch located at the base of the extension tube. This latching device shall be capable of locking the waterway in either the raised or lowered position while maintaining the ability to horizontally rotate the monitor device 360 degrees.

If the extend-a-gun is not properly stowed and the transmission is placed into drive or reverse mode with the parking brake released, it shall activate the hazard light in the cab to alert the crew.

The aluminum riser shall have a 3.00 inch (77 mm) waterway; hardcoat anodized finish and be furnished with a 3.00 inch (77 mm) Victaulic inlet and a Task Force Tips Crossfire coupling outlet.

(1) Front Discharge (front bumper)

**FRONT BUMPER DISCHARGE OUTLET**

One (1) front bumper discharge outlet shall be provided and installed in the location specified.

Akron 8000 Series Valve - 2"

**DISCHARGE VALVE**

A 2.00 inch (50 mm) Akron Brass 8000 series swing-out valve with a stainless steel ball.

Valve(s) Controlled -Operator’s Panel-

**DISCHARGE VALVE CONTROL**

The discharge shall be controlled from the pump operator’s panel location.

2" Discharge Plumbing (1 1/2" fbd)

**DISCHARGE PLUMBING**

The plumbing shall consist of 2.00 inch (50 mm) piping, and incorporate a manual drain control installed below the pump area for ease of access. Auto-drain(s) shall be installed in the discharge piping at lowest point of the plumbed system.

Term: 2" NPT x 1.5" NST SST Chiksan (on grav. shield) (no cap)

**DISCHARGE TERMINATION**

The discharge termination shall include the following components:

One (1) 2.00 inch (50 mm) NPT x 1.50 inch (38 mm) NST, polished stainless steel chiksan swivel

Locate FBD on Top Left Front of Gravelshield

**FRONT BUMPER DISCHARGE LOCATION**

The front bumper discharge shall be mounted on top of the gravel shield of the front bumper extension. The discharge shall be placed outboard of the frame rail extensions on the left side.

{Qty} NOSHOK/IC 2.5" Gauge

**DISCHARGE GAUGES**

A NOSHOK (Innovative Controls) 2.50 inch (65 mm) gauge shall be supplied for reading the pressure of each discharge greater than 1.50 inches (38 mm) in diameter, unless otherwise specified.
The gauges shall have a rugged corrosion free stainless steel case that integrates the valve stem connection, movement support, and bourdon tube support into a single unit that eliminates distortion and leakage. Clear scratch resistant molded lenses shall be used to ensure distortion-free viewing and they shall be sealed to the gauge by being trapped together with a profile gasket by a chromed stainless steel bezel. The gauges shall be filled with a synthetic mixture to dampen shock and vibration, lubricate the internal mechanisms, prevent lens condensation and ensure proper operation from –40° F to +160°F.

**0-400 PSI Scale Reading-Gauge**  
Y__N__

**GAUGE SCALE**

Each gauge shall be marked for reading a pressure range of 0-400 PSI.

**Black Markings on white gauge face**  
Y__N__

**GAUGE FACE COLOR**

Each gauge shall have black markings on a white face.

**Innovative Controls Bezels for Gauges (2.5" gauges only)**  
Y__N__

**BEZELS FOR 2.5" DISCHARGE GAUGES**

Highly-polished stainless steel Innovative Control bezels shall be provided around each of the 2.50 inch (65 mm) discharge pressure gauges to prevent corrosion and protect lenses and gauge cases. The gauges shall be installed into decorative chrome-plated mounting bezels that incorporate valve identifying verbiage and/or color labels.

**TANK TO PUMP LINE**

The connection between the tank and the pump shall be capable of the flow recommendations as set forth in (NFPA) 1901, Standard for Automotive Fire Apparatus, latest revision and shall be tested to those standards when the pump is being certified.

One (1) non-collapsible flexible hose and valve shall be incorporated into the tank to pump plumbing to allow movement in the line as the chassis flexes to avoid damage during normal road operation. Four (4) inch stainless steel schedule 10 piping shall be used to complete the connection from the tank to pump valve to the water tank.

**Integral Tank to Pump Check Valve**  
Y__N__

**TANK TO PUMP CHECK VALVE**

There shall be a tank to pump check valve, conforming to NFPA standard requirements to prevent water from back flowing at an excessive rate if the pump is being supplied from a pressurized source. The check valve shall be mounted as an integral part of the pump suction extension. A hole up to .25 inch (6.00 mm) is allowable in the check valve to release steam or other pressure buildup so that the void between the valve and check valve may drain of water that could be subject to freezing.

**Akron 8000 Series Valve - 3", Tank to Pump**  
Y__N__

**TANK TO PUMP VALVE**

A 3.00 inch (77 mm) Akron Brass 8000 series swing-out valve with a stainless steel ball.

**Valve(s) Controlled at Operator's Panel**  
Y__N__

**VALVE CONTROL**

The valve shall be controlled from the pump operator’s panel location.

**Tank Fill Line**

**TANK FILL LINE**

One (1) 2.00 inch (50.80 mm) tank fill/recirculating line shall be installed from the pump directly to the booster tank.
Akron 8000 Series Valve - 2"

**TANK FILL VALVE**

A 2.00 inch (50 mm) Akron Brass 8000 series swing-out valve with a stainless steel ball.

Valve(s) Controlled at Operator's Panel

**VALVE CONTROL**

The valve shall be controlled from the pump operator's panel location.

(Qty 1) Rear Direct Tank Fill-Pumper/Dryside & Wetside Tankers

**DIRECT TANK FILL**

There shall be an external direct tank fill port installed on the rear of the apparatus.

A total quantity of one (1) shall be provided with the following specified components

Akron 8000 Series Valve - 2 1/2"

**TANK FILL VALVE**

A 2.50 inch (65 mm) Akron Brass 8000 series swing-out valve with stainless steel ball.

Valve(s) Controlled Directly at Valve Location w/ Lever

**VALVE CONTROL**

The valve shall be controlled with a ‘swing-type’ lever directly attached to the valve. The lever shall operate just over 90 degrees of travel to provide full open / full closed positioning of the valve.

2 1/2" Piping, Rear Direct Tank Fill

**DIRECT TANK FILL PLUMBING**

The plumbing shall consist of 2.50-inch (65 mm) piping.

****Rear Suction Inlet/Intake-Left Exposed

**SUCTION INLET/INTAKE PLUMBING NO FINISH**

Any piping in the rear or side compartment shall remain exposed and be left raw finish and exposed within the side compartment.

Term: 2 1/2" NST Elbow w/Plug

**DIRECT TANK FILL PLUMBING**

The direct tank fill termination shall include the following components:

One (1) valve end cap terminating with 2.50 inch female swivel NST elbow.

One (1) 2.50 inch male self-venting plug, secured by a chain.

One (1) Fill located on right rear side

**DIRECT TANK FILL LOCATION**

One (1) direct tank fill shall be located on the right rear of the apparatus.

Extruded .125 Aluminum Body Material Construction, Pumper

**TRI-MAX™ Space Frame Body - ALUMINUM**

The apparatus body shall be a Tri-Max™ Space Frame design, which serves as an incredibly durable, structural body framework. This framework acts as a series of beams and columns that support and protect the body and its contents. The space frame design provides maximum torsional resistance and load capabilities. The entire space frame structure shall be welded together utilizing an A.W.S. Certified welding procedure. **NO EXCEPTIONS**
The space frame design shall also be required because it provides energy absorbing impact zones in the structure, thus providing increased safety to the rest of the apparatus and personnel on board. Documented proof of this extra safety shall be required upon request.

The Tri-Max™ body structure shall consist entirely of closed section members, except where the body is mounted to the chassis. Closed section members (such as square, rectangular, triangular, or round tubes) are required because they provide maximum strength and torsion rigidity. This solid tubular structural style of design ultimately adds longevity to the body structure by eliminating flex and twists in material, creating less stress and fatigue. Body designs that use independent sub-frames will not be acceptable. **NO EXCEPTIONS**

**BODY STRUCTURE MEMBERS**

The space frame body shall have triangular shaped structural members in certain areas of the body. This shape is required to prevent loss of useable compartment space. Other body structure members shall be square or rectangular. Each structural member will have a nominal outside dimension of 2.50 inches (63.50 mm) in at least one direction. The body shall be designed for maximum strength to weight ratio, therefore the gauge of sheet metal and structural members varies from .125 inches (3.18 mm) to .250 inches (6.35 mm) throughout, dependent on the design requirement.

**BODY MATERIAL TYPE**

All body structural members shall be Aluminum 6061-T6 alloy material. All .125 inch (3.18 mm) sheet material shall be Aluminum Alloy 5052-H32 and .250 inch (6.35 mm) sheet materials shall be Aluminum Alloy 3003. These alloys are required because it provides optimum all-around performance for strength, manufacturing properties, and corrosion resistance.

**ECK® ANTI-CORROSION PROCESS**

Absolutely no dissimilar metals shall be used in the body and its supporting substructure without being separated by Eck®, which prevents corrosion by providing a barrier between dissimilar metals, sealing out moisture and absorbing energy created by a dissimilar metal reaction.

**FRONT BODY COMPARTMENT WALLS**

The front compartment walls of both forward most compartments shall be sheet finished. No overlay material shall be visible from the interior of the compartments.

**REAR BODY COMPARTMENT WALLS**

The rear compartment walls of both rearward most compartments shall be sheet finished. No overlay material shall be visible from the interior of the compartments. Access panels from the rear walls shall be strategically placed to ensure access to the rear taillight clusters for any servicing that may be completed.

**COMPARTMENT TOP**

The top of the compartments shall be an integral portion of the body. No overlay material shall be visible from the interior of the compartments.

**COMPARTMENT FLOORS**

The body compartments shall be enclosed with aluminum sheet metal as specified above. The compartment floors shall have a 1.00 inch (25.40 mm) lip downward at the door opening side of the compartment. This lip shall integrate with a structural member on the bottom edge and form a "sweep-out" compartment. This design shall also allow for a structural flush fitting door frame and a complete door/weather seal.

**COMPARTMENT LOAD CAPACITY**

Each compartment shall have a minimum of one additional structural compartment floor support centered on the underside of the compartment floor. This additional member shall be integral with the rest of the body structure. Each compartment must be designed, and 3rd party analyzed to carry a working load of:

- Full depth side compartment: 1,000 lbs (453.59 kg) per compartment
- Half depth side compartment: 750 lbs (340.19 kg) per compartment
Rear center compartment: 1,500 lbs (680.39 kg)

NO EXCEPTIONS

NOTE: These values are for design purposes only for individual compartment construction and are not meant to be used as an actual overall weight rating for equipment load per compartment for the specified apparatus. The apparatus shall be engineered such that the completed unit, when loaded to its estimated in-service weight, shall comply with the gross axle weight ratings (GAWR), the overall gross vehicle weight rating (GVWR), and the chassis manufacturer's load balance guidelines per NFPA.

EXTERIOR HOSE BED WALLS

The exterior hose bed walls shall be an integral portion of the body. The wall shall give a smooth exterior look and finish with no vertical supports tubing visible from the exterior of the truck.

FASTENERS

All bolts and nuts used in the finish construction of the apparatus shall be coated stainless steel which helps prevent dissimilar metal electrolytic reaction and corrosion. Any bolt extending into a compartment or into the hose bed area shall have an acorn nut attached or be protected in such manner where sharp edges are avoided.

FINITE ELEMENT ANALYSIS

The proposed body design must have completed a review and analysis by a legitimate 3rd party engineering firm. At a minimum, the 3rd party must have conducted a computer model finite element analysis of the proposed design. The analysis is to include real world working load scenarios. Analysis to cover both static and dynamic situations must be completed. The purpose of the finite element analysis is to ensure proper design of the apparatus body, and that it is capable of carrying the typical fire apparatus loads and those specified by NFPA for equipment. The analysis process must conclude that the body structure is properly designed and manufactured to provide longevity under normal conditions. The 3rd party must also validate the manufacturing processes are consistent with the design and analysis performed. Proof of having completed this testing must be submitted with the bid. NO EXCEPTIONS

PPG Painting/Finish Specifications

- Aluminum/Pumper/Tanker

PPG PAINT SPECIFICATIONS

All bright metal fittings, if unavailable in stainless steel, shall be heavily chrome plated.

Critical body and sub-frame area which cannot be primed after assembly shall be pre-painted.

All welded metal surfaces shall be ground to a smooth surface prior to degreasing and high pressure, high temperature phosphatizing process. The entire surface shall be sprayed with a non-chromate sealing compound to prevent formulation of stains or flash rust on previously phosphatized parts.

The paint applied to the apparatus shall be PPG Industries Delta® brand, applied throughout a multi-step process including at least two coats of each color and clear coat finish.

The coating shall be an infra-red, baked air dried. The coatings shall provide full gloss finished suitable for application by high-pressure airless or conventional low pressure air atomizing spray.

The coatings shall not contain lead, cadmium or arsenic. The polyisocyanate component shall consist of only aliphatic isocyanates, with no portion being aromatic isocyanates in character. The solvents used in all components and products shall not contain ethylene glycol mono-ethyl ethers or their acetates (commercially recognized as cello solves), nor shall they contain any chlorinated hydrocarbons. The products shall have no adverse effects on the health or present any unusual hazard to personnel when used according to manufacturer's recommendations for handling and proper protective safety equipment, and for its intended use.

The coating system, as supplied and recommended for application, shall meet all applicable federal, state and local laws and regulations now in force or at any time during the courses of the bid.

The manufacturer shall supply (upon request) for each product and component of the system, a properly complete OSHA "Safety Data Sheet".
The following documents of the issue in effect on the date of the invitation to quote form a part of this document to the extent specified herein:

Federal Standards: Number 141A and 141B paint, varnish, lacquer and related material: methods of inspection, sampling, and testing.

Military Standard: MIL-C 83486B Coating, Urethane, Aliphatic Isocyanates, for Aerospace applications.


The entire exterior body structure (excluding roll-up doors) shall receive the primer coats and the finish coats. The apparatus body will be painted in a down draft type paint booth to reduce dust, dirt or impurities in the finish paint. The painted surfaces shall have a finish with no runs, sags, craters, pinholes or other defects. The coating will meet the following test performance properties as a minimum standard.

**Body Paint**

- **Single**

**BODY PAINT COLOR**

Body Paint color to be (Specify) Y___N___

The apparatus body shall be painted ("MUST SPECIFY"). Y___N___

Compt. Speedliner Finish, Alum - Pumper/Dryside Tanker

**SPEEDLINER COMPARTMENT FINISH**

The compartment interiors shall be coated with Speedliner.

**Speedliner Medium Gray Color**

COMPARTMENT FINISH COLOR Y___N___

The Speedliner Color shall be Medium Gray.

**Diamond Plate front overlays and raw Alum rear overlays (p) (MATCH BODY)**

DIAMOND PLATE FRONT OVERLAYS Y___N___

The entire front face of the apparatus body shall have aluminum diamond plate overlays installed.

**RAW ALUMINUM REAR OVERLAYS**

The entire rear face of the apparatus body shall have raw aluminum overlays installed for the installation of chevron striping.

All overlay materials shall be coated with 3M adhesive sealant on the back portion to provide an insulating barrier between dissimilar metals.

**Front Vertical Overlay Corner Trim - 1/8” Aluminum Diamond Plate**

FRONT CORNER TRIM 1/8” ALUMINUM DIAMOND PLATE Y___N___

The front of the apparatus body, vertical wall overlay shall be integrated with a 1/8” aluminum diamond plate corner trim pieces for edge protection. The vertical edge trim piece shall extend from the top to bottom and shall be fastened at a minimum of three locations, top, middle, and bottom.

**Rear Vertical Overlay Corner Trim - 1/8” Aluminum Diamond Plate**

REAR CORNER TRIM 1/8” ALUMINUM DIAMOND PLATE Y___N___

The rear face of the apparatus body, vertical wall overlays shall be installed with a .125 inch aluminum diamond plate 1.00 inch by 1.00 inch corner trim piece, for edge protection. The vertical edge trim piece shall extend from the top to bottom and shall be fastened at a minimum of three locations, top, middle, and bottom.

The vertical edge trim piece that is protecting the chevron striping surface or that is utilized for the purpose of striping, shall be secured utilizing fasteners only.
Catwalks- embossed aluminum diamond plate (see drop down for avail options)  
Y___N___

**CATWALKS**

The catwalks shall be constructed with materials of a non-slip .125 inch embossed aluminum diamond plate.

Vibra-Torque Body Mounting, Pumper, Tanker  
Y___N___

**VIBRA-TORQUE™ BODY MOUNTING SYSTEM**

The entire body module assembly shall be mounted so that it “floats” above the chassis frame rails exclusively with Vibra-Torq™ torsion isolator assemblies to reduce the vibration and stress providing an extremely durable body mounting system.

The body substructure shall be mounted above the frame to allow independent flexing to occur between the body and the chassis. Each assembly shall be mounted to the chassis frame rails with steel, gusseted mounting brackets. Each bracket shall be powder coated for corrosion resistance. Each body mount bracket shall be mounted to the side chassis frame flange with two 5/8”-UNC Grade 5 HHCS.

Each assembly shall have a two-part rubber vibration isolator. The isolator shall be of a specific durometer to carry the necessary loads of the apparatus body, equipment, tank, water, and hose. The quantity of mounts utilized shall correspond directly to the anticipated weight being supported. Certain assemblies shall also incorporate a torsion spring. Helical coil springs shall be incorporated into specific mounts in tandem with the rubber isolators to minimize the stress absorbed by the body caused from chassis frame rail flexing.

There shall be no welding to the chassis frame rail sides, web or flanges, or drilling of holes in the top or bottom frame flanges between axles. All body to chassis connections shall be bolted so that in the event of an accident, the body shall be easily removable from the truck chassis for repair or replacement.

Because of the constant vibration and twisting action that occurs in chassis frame rails and suspension, the torsion mounting system is required to minimize the possibility of premature body structural failures. The Vibra-Torque™ body mounting system shall have a lifetime warranty. NO EXCEPTIONS

99” Wide Body  
Y___N___

**BODY STRUCTURE WIDTH**

The width of the apparatus body from the outside of the left compartments to the outside of the right compartments shall be 99.00 inch (2.51 m) excluding any attached peripherals such as rub rails, fenderettes, grab handles, etc.

Compartment Filter Vent System  
Y___N___

**COMPARTMENT VENTILATION**

To allow for proper air circulation & flow, each compartment shall have a venting route. The venting locations shall be determined by best-fit for each body configuration. Chrome louvered plate vents shall be installed appropriately on the compartment interior walls.

1650-22 (LS/RS Full Depth) Horiz Ladder Box-STD Wheel Panel HT  
Y___N___

**COMPARTMENTATION**

The following compartments shall be supplied on the apparatus:

Compartment "L1"

There shall be one (1) full height compartment ahead of the rear wheels on the left side of the apparatus.

The approximate interior dimensions of this compartment shall be 49.00 inches (1244.60 mm) wide by 69.00 inches (1752.60 mm) high with a depth of 25.50 inches (647.70 mm).

The framed opening shall measure approximately 46.50 inches (1181.10 mm) wide by 65.00 inches (1651.00 mm) high.

The compartment will have approximately 49.60 cubic feet (1.40 cu m) of space.

Compartment "L2"
There shall be one (1) compartment located directly over the rear wheels on the left side of the apparatus.

The approximate interior dimensions of this compartment shall be 62.00 inches (1574.80 mm) wide by 39.50 inches high with a depth of 25.50 inches (647.70 mm).

The framed opening shall measure approximately 62.00 inches (1574.80 mm) wide by 35.50 inches high.

The compartment will have approximately 31.90 cubic feet (0.90 cu m) of space.

Compartment "L3"

There shall be one (1) full height compartment located behind the rear wheels on the left side of the apparatus.

The approximate interior dimensions of this compartment shall be 49.00 inches (1244.60 mm) wide by 69.00 inches (1752.60 mm) high with an upper depth of 25.50 inches (647.70 mm) and the lower portion being transverse into the rear compartment, unless partitions are installed.

The framed opening shall measure approximately 46.50 inches (1181.10 mm) wide by 65.00 inches (1651.00 mm) high.

The compartment will have approximately 49.60 cubic feet (1.40 cu m) of space.

Compartment "R1"

There shall be one (1) full height compartment ahead of the rear wheels on the right side of the apparatus.

The approximate interior dimensions of this compartment shall be 49.00 inches (1244.60 mm) wide by 69.00 inches (1752.60 mm) high with a depth of 25.50 inches (647.70 mm).

The framed opening shall measure approximately 46.50 inches (1181.10 mm) wide by 65.00 inches (1651.00 mm) high.

The compartment will have approximately 49.60 cubic feet (1.40 cu m) of space.

Compartment "R2"

There shall be one (1) compartment located directly over the rear wheels on the right side of the apparatus.

The approximate interior dimensions of this compartment shall be 62.00 inches (1574.80 mm) wide by 39.50 inches high with a depth of 25.50 inches (647.70 mm).

The framed opening shall measure approximately 62.00 inches (1574.80 mm) wide by 35.50 inches high.

The compartment will have approximately 31.90 cubic feet (0.90 cu m) of space.

Compartment "R3"

There shall be one (1) full height compartment located behind the rear wheels on the right side of the apparatus.

The approximate interior dimensions of this compartment shall be 49.00 inches (1244.60 mm) wide by 69.00 inches (1752.60 mm) high with an upper depth of 25.50 inches (647.70 mm) and the lower portion being transverse into the rear compartment, unless partitions are installed.

The framed opening shall measure approximately 46.50 inches (1181.10 mm) wide by 65.00 inches (1651.00 mm) high.

The compartment will have approximately 49.60 cubic feet (1.40 cu m) of space.

Non Locking Roll-Up Doors (-4) Side Compts

ROLL-UP DOOR CONSTRUCTION

All horizontal and vertical side compartment doors shall be roll-up style doors.

R.O.M (Roll-Up Doors)
A R•O•M Corporation Series IV roll-up shutter door shall be installed. Each shutter slat, track, bottom rail, and drip rail shall be constructed from anodized 6063 T6 aluminum.

Shutter slats shall feature a double wall extrusion 0.315 inches thick with a concave interior surface to minimize loose equipment jamming the shutter door closed. Shutter slats shall feature an interlocking end shoe to prevent side to side binding of the shutter door during operation. Slat inner seal shall be a one piece PVC extrusion; seal design shall be such to prevent metal to metal contact while minimizing dirt and water from entering the compartment.

Shutter door track shall be one piece design with integral overlapping flange to provide a clean finished look without the need of caulk. Door track shall feature an extruded Santoprene rubber double lip low profile side seal with a silicone co-extruded back to reduce friction during shutter operation.

Shutter bottom rail shall be a one piece double wall extrusion with integrated finger pull. Finger pull shall be curved upward with a linear striated surface to improve operator grip while operating the shutter door. Bottom rail seal shall have a smooth contoured interior surface to prevent loose equipment from jamming the shutter door. Bottom rail seal shall be made from Santoprene; it will be a double "V" seal to prevent water and debris from entering compartment. Bottom rail lift bar shall be a one piece "D" shaped aluminum extrusion with linear striations to improve operator grip during operation. Lift bar shall have a wall thickness of 0.125 inches. Lift bar shall be supported by no less than two pivot blocks; pivot blocks shall be constructed from Type 66 Glass filled reinforced nylon for superior strength. Bottom rail end blocks shall have incorporated drain holes which will allow any moisture that collects inside the extrusion to drain out.

Shutter door shall have an enclosed counter balance system. Counter balance system shall be 4.00 inches in diameter and held in place by 2 heavy duty 18 gauge zinc plated plates. Counter balance system shall have 2 over-molded rubber guide wheels to provide a smooth transition from vertical track to counter balance system.

Side Compartment Doors, satin finish

**SIDE COMPARTMENT DOOR ALUMINUM SATIN FINISH**

The side compartment roll up doors shall be satin aluminum finish.

**DOOR ASSIST STRAPS**

There shall be nylon straps installed on both the left and right body side 'high side' compartment doors to assist in closing the door. The strap shall be attached to each door and permanently mounted to the rearward wall with footman loops using Nutserts, half way between the top and bottom of the compartment.

Door Open Switch/Warning Light - Roll Up Doors

**DOOR OPEN INDICATOR**

Each roll up door shall have an integral door open indicator magnet in the lift bar.

If the door is not properly closed and the parking brake is released, it shall activate the "hazard light" in the cab to alert the crew.

Rear Center Compartment - "B-1" (38"w x 35"h framed)

**REAR CENTER COMPARTMENT**

There shall be one (1) compartment, "B1", located at the rear of the apparatus, below the hose bed access area. The approximate interior dimensions of this compartment shall be 43.00 inches (1092.20 mm) wide and 41.00 inches (1014.40 mm) high or as high as possible determined by the hose bed height and rear configuration. The depth shall be determined by the length of the rear side compartments specified and maximized for the suspension specified for the chassis.

The framed opening shall be approximately 38.00 inches (965.20 mm) wide and 35.00 inches (889.00 mm) high.

Rear Compt - R.O.M Non Locking Roll Up Door Option (38x35)

**REAR COMPARTMENT DOOR**
A non-locking R•O•M Corporation Series IV roll-up shutter door shall be installed. Each shutter slat, track, bottom rail, and drip rail shall be constructed from anodized 6063 T6 aluminum.

Shutter slats shall feature a double wall extrusion 0.315 inches thick with a concave interior surface to minimize loose equipment jamming the shutter door closed. Shutter slats shall feature an interlocking end shoe to prevent side to side binding of the shutter door during operation. Slats must have interlocking joints with an inverted locking flange. Slat inner seal shall be a one piece PVC extrusion; seal design shall be such to prevent metal to metal contact while minimizing dirt and water from entering the compartment.

Shutter door track shall be one piece design with integral overlapping flange to provide a clean finished look without the need of caulk. Door track shall feature an extruded Santoprene rubber double lip low profile side seal with a silicone co-extruded back to reduce friction during shutter operation.

Shutter bottom rail shall be a one piece double wall extrusion with integrated finger pull. Finger pull shall be curved upward with a linear striated surface to improve operator grip while operating the shutter door. Bottom rail shall have a smooth contoured interior surface to prevent loose equipment from jamming the shutter door. Bottom rail seal shall be made from Santoprene; it will be a double “V” seal to prevent water and debris from entering compartment. Bottom rail lift bar shall be a one piece “D” shaped aluminum extrusion with linear striations to improve operator grip during operation. Lift bar shall have a wall thickness of 0.125 inches. Lift bar shall be supported by no less than two pivot blocks; pivot blocks shall be constructed from Type 66 Glass filled reinforced nylon for superior strength. Bottom rail end blocks shall have incorporated drain holes which will allow any moisture that collects inside the extrusion to drain out.

Shutter door shall have an enclosed counter balance system. Counter balance system shall be 4.00 inches in diameter and held in place by 2 heavy duty 18 gauge zinc plated plates. Counter balance system shall have 2 over-molded rubber guide wheels to provide a smooth transition from vertical track to counter balance system.

Rear Center Compartment Door, satin finish

REAR COMPARTMENT DOOR FINISH

Y___N___

The rear center compartment door shall be satin aluminum finish.

Door Open Switch/Warning Light - Roll Up Door ROM (Single)

DOOR OPEN INDICATOR

Y___N___

Each roll up door shall have an integral door open indicator magnet in the lift bar.

If the door is not properly closed and the parking brake is released, it shall activate the “hazard light” in the cab to alert the crew.

Built In Permanent Recessed Intermediate Rear Step (8”-inch) {SEE PHOTO}

RECESSED INTERMEDIATE REAR STEP

Y___N___

There will be an 8.00 inch recessed intermediate step above the rear center compartment designed into the rear body wall. This step will shorten the length of the hose bed by 8.00 inches and lower the door opening of the rear center compartment. The stepping surface shall be overlaid with embossed diamond plate, while the side shall be overlaid with standard diamond plate.

(1) Step Lighting, LED Tube 9”

STEP LIGHTING

Y___N___

One (1) light shall be installed to illuminate the stepping areas as provided. The light shall be a LED Tube light model #RX-15T16-5050-21CM with an aluminum mounting bezel.

The light shall be directed towards and positioned above the stepping surfaces.

Step Light Activation - Park Brake

STEP LIGHT ACTIVATION

Y___N___

The step light shall be activated when the park brake is set.

Brushed Stainless Steel Sill Plates

SILL PLATES

Y___N___
Brushed stainless steel sill plates shall be installed at the bottom of each body compartment door opening.

(2) LED Tube Lights per Compartment, (p) Y___N___

COMPARTMENT LIGHTING

Two (2) LED Tube lights model #RX-15T16-5050 shall be installed in each body compartment. The tube lights shall be centered vertically along each side of the door framing and at maximum length available to fit the opening.

The lights in each compartment shall be on a separate circuit, turning on only those lights that have open compartment doors.

Rear Tailboard - Flat Back (pumper/dryside tanker/rescue) Y___N___

REAR TAILBOARD

The rear of the apparatus body shall be vertical in design - otherwise known as a 'flat-back'.

The rear tailboard shall be fabricated of the same tubular materials as used in the apparatus body.

The tailboard shall be an independent assembly welded to the rear body structural framing to provide body protection and a solid rear stepping platform.

The rear step shall be designed to incorporate "crush zone" technology. This idea incorporates lighter materials in the tailboard than the body structure so the step will "crush" in a collision before the body structure.

On the rear body surface, a sign shall be attached that states: "DO NOT RIDE ON REAR STEP, DEATH OR SERIOUS INJURY MAY RESULT."

The rear tailboard and body shall be constructed such that the angle of departure shall be no less than 8 degrees at the rear of the apparatus when fully loaded (NFPA) 1901, Standard for Automotive Fire Apparatus.

Step - 13.5" Deep w/Extruded Stair Tread "Diamonback" Insert Y___N___

TAILBOARD LENGTH

The rear tailboard shall be approximately 13.50 inches (342.90 mm) deep and shall incorporate an extruded stair tread "Diamonback" material stepping surface bolted in place which spans the width of the apparatus on non-recess designs, and as wide as possible on inset recess designs.

The extruded stepping surface shall be completely enclosed by the supporting structural framework to minimize damage.

The ventilated "Diamonback" material shall be capable of being easily replaced if necessary, using only hand tools. The framework shall be covered with an adhesive tape providing an aggressive traction surface. Use of any aluminum diamond plate material on these areas shall not be acceptable.

43" W Rear Slide Out Platform-SlideMaster w/ "Aluminum Diamond Grip Strut" Y___N___

SLIDE OUT PLATFORM

There shall be a SlideMaster brand slide out platform installed centered under the rear of the apparatus.

The platform shall be 43.00 inches wide and shall extend approximately 20.00 inches from the stowed position. The platform stepping surface shall be constructed of "Aluminum Diamond Grip Strut" material with adhesive tape covering the frame work.

The face of the platform shall have no rub rail installed for ease of deployment. The step will be reinforced on the back edge.

The platform shall lock into place while in the extended and stowed positions. There shall be a reinforcement channel on the back of the step.

If the slide out step is not properly stowed and the parking brake is released, it shall activate the hazard light in the cab to alert the crew.
Wheel Wells, Single Axle, Pumper/RM Pumper/Tanker-STD Height wheel panels

**WHEEL WHEELS**

Wheel wells shall have semicircular black polymer composite inner liners that are bolted to the wheel well panel and supported inboard by brackets that are connected to the body framework. Each wheel well shall be a continuous piece with no breaks or ledges where road grime or debris may accumulate. This liner shall be removable for access to suspension assembly for repairs. There shall be no exception to the bolted wheel well inner liner requirement.

Single Axle Smart Storage - painted- Pumper/RM Pumper/Tanker

**WHEEL WELL MODULES**

The body wheel well area shall be fabricated of same material type as the body and finish painted. There shall be "smart storage" compartmentation features incorporated on each side of the apparatus body wheel well modules to utilize and maximize storage space availability.

Provisions on the left side in front of the axle, Pumper/Tanker/Rescue

**LEFT FRONT WHEEL WELL**

There shall be provisions in the wheel well on the left side in front of the axle.

6.75" dia. SCBA Compartment (3 SCBA bottles)

**SCBA COMPARTMENT**

The compartment shall hold three (3) 6.75 inch (171.45 mm) Diameter x 24.00 inch (609.60 mm) long SCBA bottles with 1.00 inch (25.40 mm) nylon safety loops installed.

Provisions on the left side behind the axle, Pumper/Tanker/Rescue

**LEFT REAR WHEEL WELL**

There shall be provisions in the wheel well on the left side behind the axle.

Fuel Fill (custom chassis only) -No Storage, Fuel Fill Behind Smart Storage Door

**FUEL FILL**

The fuel fill shall be located within the smart storage compartment.

Smart Storage Rear Fuel Fill Assembly, Pumper/Rescue

**SMART STORAGE FUEL FILL ASSEMBLY**

There shall be a fuel fill assembly located on the apparatus body accessing the chassis supplied fuel tank. The assembly shall be located in the rear Smart Storage module specified behind the rear axle.

There shall be a drain in the fuel fill assembly to allow over flow to drain on the back side of the apparatus body. The fuel fill cap shall be manufactured of plastic materials, green in color and equipped with a tether.

The fuel fill cap shall be labeled "DIESEL FUEL". The stainless steel fuel fill neck shall have a .375 inch inside diameter vent line installed from the top of the fuel tank to the fill tube.

Provisions on the right side in front of the axle, Pumper/Tanker/Rescue

**RIGHT FRONT WHEEL WELL**

There shall be provisions in the wheel well on the front side in front of the axle.

6.75" dia. SCBA Compartment (3 SCBA bottles)

**SCBA COMPARTMENT**

The compartment shall hold three (3) 6.75 inch (171.45 mm) Diameter x 24.00 inch (609.60 mm) long SCBA bottles with 1.00 inch (25.40 mm) nylon safety loops installed.

Provisions on the right side behind the axle, Pumper/Tanker/Rescue

**RIGHT REAR WHEEL WELL**
There shall be provisions in the wheel well on the right side behind the axle.

**6.75" dia. SCBA Compartment (3 SCBA bottles)**

**SCBA COMPARTMENT**

The compartment shall hold three (3) 6.75 inch (171.45 mm) Diameter x 24.00 inch (609.60 mm) long SCBA bottles with 1.00 inch (25.40 mm) nylon safety loops installed.

**Smart Storage Door-Finish- "Painted Stainless"-Round Latches**

**SMART STORAGE DOORS**

The smart storage compartment doors shall be smooth and painted stainless steel to match body job color. Where a module storage compartment is specified, a hinged door shall be provided. Each compartment door shall be secured with a round chrome latch.

**Door Open Switch/Warning Light - Smart Storage**

**DOOR OPEN INDICATOR**

There shall be a switch installed for each smart storage compartment door.

If the door is not properly closed and the parking brake is released, it shall activate the “hazard light” in the cab to alert the crew.

**Rear Fenderettes to be Polished Stainless**

**FENDERETTES**

Two (2) polished stainless steel fenderettes shall be provided and installed on body rear wheel well openings, one (1) each side. Rubber welting shall be provided between the body and the crown to seal the seam and restrict moisture from entering. A dielectric barrier shall be provided between the fender crown Fasteners (screws) and the fender sheet metal to resist deterioration.

**Hosebed Description**

**HOSE STORAGE**

A hosebed shall be provided and installed with the minimum capacity as required by (NFPA) 1901, Standard for Automotive Fire Apparatus.

The hosebed shall have a slotted .25 inch (6.35 mm) aluminum flooring installed to allow drainage through the tank cavity to the ground below.

The aluminum flooring shall be manufactured in discrete sections to allow for ease of removal and stability. The area shall be free of sharp edges to protect the hose when loading and unloading.

**Hosebed Walls w/Brushed Stainless Steel Finish**

**HOSE BED AREA**

The hosebed area of the apparatus shall be overlaid with brushed stainless steel material.

**Rear Hosebed Corners Trimmed w/ Brushed SST**

**HOSEBED AREA TRIMMED W/ BRUSHED SST**

The vertical corners at the back hosebed shall be trimmed with brushed stainless steel. The trim shall extend from the hose floor level up to the top edge of the body side.

**Hose Bed Side Walls Cap w/ Brushed SST**

The top rail on the hosebed side walls shall have a trim cap fabricated of 16 gauge brushed 304L stainless steel. The cap shall run the entire length of the hosebed side wall and shall provide a smooth surface with a highly finished appearance. It shall extend down at least 1” on each side of the hosebed side wall.

**Walls to be 90" tall**

**HOSE BED WALL HEIGHT**
The walls of the hose bed shall be 90.00 inches (2.29 m) tall, measured from the bottom edge of the compartments to the top flange.

Syntex Vinyl Coated Nylon - Ext. front & Elastic cord sides

SYNTEX VINYL COATED NYLON HOSE BED COVER

There shall be a hose bed cover provided and installed with the apparatus to cover the top of the hose bed area.

The cover shall be held in place by extruded aluminum channel on the front and an elastic shock cord sewn into the tarp with brass grommets where the shock cord passes through the hose bed cover on the sides. Hooks shall be provided on the sides to provide a means of attaching the cover to the apparatus. The hooks shall be made of cast aluminum.

Cover to be Red

HOSE BED COVER COLOR

The hose bed cover shall be red in color.

Rear Hosebed Restraint - Syntex Vinyl

SYNTEX VINYL REAR HOSEBED RESTRAINT

There shall be a vinyl flap that extends down over the rear of the hosebed provided and installed with the apparatus. The cover shall be fastened by an elastic shock cord sewn into the tarp with brass grommets where the shock cord passes through the hosebed cover. Hooks shall be provided on the lower corners to provide a means of attaching the cover to the apparatus. The hooks shall be made of cast aluminum.

Rear Flap to be Red

REAR FLAP COLOR

The rear flap shall be red.

(Qty 2) Unity LED Lights for Hose bed - Spot & Flood

LED HOSE BED SPOT AND FLOOD LIGHTS

There shall be two (2) 6.00 inch (152 mm) LED Unity deck light model #AG-S-P46*LC, one (1) spot and one (1) flood, with clear LED wide flood lamp provided to illuminate the hose bed.

Each light shall have a heavy duty chrome finish and rotate 360 degrees horizontally and 180 degrees vertically. The lamp shall be 12V with 2,730 candle power 50,000 hours of lamp life.

(Qty 2) Hose bed Lights-On Horizontal Stanchions

HOSE BED LIGHTS LOCATION

The two (2) hose bed lights shall be installed at the rear of the apparatus, one (1) each side mounted to the rear horizontal stanchions specified.

(Qty 2) Hose bed Lights to Illuminate w/ Park Brake

HOSE BED LIGHT ACTIVATION

The hose bed lights shall be activated when the park brake is set.

Dunnage Area in Hosebed (KEEP FOR LOW HOSE BED/GENERATOR/ETC)

HOSEBED DUNNAGE AREA

A vertical bulkhead shall be provided and installed at the front of the hosebed area, behind the water tank fill tower, forming a storage area that is separated from the hose bed.

The rear face of the bulkhead shall serve as a mounting surface for the hose bed dividers, resulting in the ability to move any hose bed divider across the entire width of the hose bed.

One (1) Weldon 2631 LED- in Hose Bed Dunnage

LED HOSE BED DUNNAGE COMPARTMENT LIGHTING
There shall be one (1) Weldon model #2631-0000-30 LED light mounted in the hose bed dunnage compartment.

The hose bed dunnage lighting shall be activated when the park brake is applied.

Qty Full Height Reinforced Hosebed Divider(s) w/hand cut-out(s) Y___N___

**REINFORCED HOSEBED DIVIDER WITH HAND CUTOUT**

There shall be a full height adjustable reinforced hosebed divider provided and installed in the hose bed area of the apparatus body.

The divider shall be fabricated of .25 inch (6.35 mm) thick aluminum plate with a double sided reinforcement and attached to the adjustable slide rails. The rear of the divider shall have a radius to provide a smooth corner and a hand cut out to aid in access to the hose bed area. The top and rear edges shall be reinforced with 1.00 inch (25.40 mm) round aluminum tubing for extra rigidity. Hose payout shall be unobstructed by the divider.

There shall be a total of one (1) provided and installed in the hose bed.

Hose Load (Select Options for Qty/Size of Hoseload)-More Opts avail-opt/pkg ind Y___N___

**HOSE LOAD**

The hosebed shall accommodate the following hose loads:

*SELECT HOSE BAY 1* (BAY 1 IS FAR LEFT, GO L TO R) Y___N___

**BAY 1:**

3" Hose-600 feet
-600 feet of 3.00 inch hose Y___N___

*SELECT HOSE BAY 2* (BAYS GO L TO R) Y___N___

**BAY 2:**

3" Hose-600 feet
-600 feet of 3.00 inch hose Y___N___

UPF Poly Tank - 1000 gal Pumpers Y___N___

**TANK CAPACITY**

The tank shall be 1000 gallons (3785 liters) in capacity.

UPF Poly Tank Verbiage Y___N___

**UPF POLY TANK III**

The booster tank shall be constructed of PT3™ polypropylene material. This material shall be a non-corrosive stress relieved thermoplastic and UV stabilized for maximum protection. The booster and/or foam tank shall be of a specific configuration and is so designed to be completely independent of the body and compartments.

All joints and seams shall be fused using nitrogen gas as required and tested for maximum strength and integrity. The tank construction shall include PolyProSeal™ technology wherein a sealant shall 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 shall be manufactured of a minimum of 3/8" PT3™ polypropylene. All partitions shall be equipped with vent and air holes to permit movement of air and water between compartments. The partitions shall be designed to provide maximum water flow. All swash partitions interlock with one another and are completely fused to each other as well as to the walls of the tank. All partitions and spacing shall comply with (NFPA) 1901, Standard for Automotive Fire Apparatus. The walls shall 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 .125 on all dimensions.

**WATER FILL TOWER AND COVER**

The tank shall have a combination vent and manual fill tower. The fill tower shall be constructed of .50 inch (12.7 mm) PT3™ polypropylene. The fill tower shall be blue in color indicating that it is a water-only fill tower. The tower shall have a
.25 inch (6.4 mm) thick removable polypropylene screen and a PT3™

Polypropylene hinged cover. The capacity of the tank shall be engraved on the top of the fill tower lid. Inside the fill tower there shall be a combination vent/overflow pipe.

The tank cover shall be constructed of .50 inch (12.7 mm) 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(s) shall be flush or recessed 3/8” from the top of the tank and shall be fused to the tank walls and longitudinal partitions for maximum integrity. Each one of the covers shall have hold downs consisting of 2.00 inch (50 mm) minimum polypropylene dowels spaced a maximum of 40.00 inch (1016 mm) apart. These dowels shall extend through the covers and will assist in keeping the covers rigid under fast filling conditions. A minimum of two lifting dowels shall accommodate the necessary lifting hardware.

MOUNTING

The UPF Poly-Tank® III shall rest on the body cross members in conjunction with such additional cross members, spaced at a distance that would not allow for more than 530 square inches of unsupported area under the tank floor. In cases where overall height of the tank exceeds 40.00 inch (1016 mm), cross member spacing must be decreased to allow for not more than 400 square inches of unsupported area. The tank must be isolated from the cross members through the use of hard rubber strips with a minimum thickness and width dimension of .25 inch (6.4 mm) x 1.00 inch (25 mm) and a Shore A Hardness of approximately 60 durometer. The rubber must be installed so it will not become dislodged during normal operation of the vehicle. Additionally, the tank must be supported around the entire bottom outside perimeter and captured both in the front and rear as well as side to side to prevent tank from shifting during vehicle operation.

A picture frame type cradle mount with a minimum of 2.00 inch (50 mm) x 2.00 inch (50 mm) x .25 inch (6.4 mm) mild steel, stainless steel, or aluminum angle shall be provided or the use of corner angles having a minimum dimension of 4.00 inch (100 mm) x 4.00 inch (100 mm) x 4.00 inch (100 mm) by 6.00 inch (150 mm) high are permitted for the purpose of capturing the tank.

Although the tank is designed on a free floating suspension principle, it is required that the tank have adequate vertical hold down restraints to minimize movement during vehicle operation. If proper retention has not been incorporated into the apparatus hose floor structure, an optional mounting restraint system shall be located on top of the tank, half way between the front and the rear on each side of the tank. These stops can be constructed of steel, stainless steel or aluminum angle having minimum dimensions of 3.00 inch (77 mm) x 3.00 inch (77 mm) x .25 inch (6.4 mm) and shall be approximately 6.00 inch (150 mm) to 12.00 inch (304.80 mm) long. These brackets must incorporate rubber isolating pads with a minimum thickness of .25 inch and a hardness of 60 durometer affixed on the underside of the angle. The angle should then be bolted to the body side walls of the vehicle while extending down to rest on the top outside edge of the upper side wall of the tank. Hose beds floors must be so designed that the floor slat supports extend full width from side wall to side wall and are not permitted to drop off the edge of the tank or in any way come in contact with the individual covers where a puncture could occur. Tank top must be capable of supporting loads up to 200 lbs. per sq. foot when evenly distributed. Other equipment such as generators, portable pumps, etc. must not be mounted directly to the tank top unless provisions have been designed into the Poly-Tank® III for that purpose. The tank shall be completely removable without disturbing or dismantling the apparatus structure. The tank must be designed and fabricated by a tank manufacturer that is ISO 9001:2008 certified. The ISO certification must be to the current standard in effect at the time of the design and fabrication of the tank.

TANKNOLOGY™ TAG

A tag shall 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 shall include the capacity of the water and foam(s), 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.

Fill Tower & Overflow 4"  Y__N___

FILL TOWER

The fill opening shall be approximately 13.00 inches (330.20 mm) x 12.00 inches (304.80 mm). The tower will have a .25 inch (6.40 mm) thick removable Polypropylene screen and a Polypropylene hinged type cover that will open if the tank is filled at an excess rate.

There shall be a removable .25 inch (6.40 mm) thick Polypropylene screen to prevent debris from falling into the tank.
The fill tower shall have a 4.00 inch (100.00 mm) overflow that will discharge underneath the tank, behind the rear wheels. The overflow shall terminate above the tank water level when filled to the rated capacity.

**Fill Tower Location - Left Fr Hosebed**

*FILL TOWER LOCATION*

The fill tower shall be located to the left side at the front of the hose bed.

**Tank Sump Verbiage (USE for 1 TTP Valve)**

*SUMP*

The sump will be constructed in an 8.00 inch (203.20 mm) x 16.00 inch (406.40 mm) x 3.00 inch (77.00 mm) deep area.

The sump will be constructed of .50 inch (12.70 mm) Polyprene and be located in line with the tank suction valve. There shall be a 4.00 inch (100.00 mm) schedule 40 Polyprene tube installed that will run from the suction outlet to the sump location. The tank will have an anti-swirl plate located approximately 2.00 inch (50 mm) above the sump.

**Sump 3" Plug (no valve)**

*SUMP PLUG*

The sump shall have a 3.00 inch (77.00 mm) plug for use in draining and cleaning out the tank.

**Tank Outlets Verbiage**

*OUTLETS*

In addition to the tank suction valve outlet located in the sump, there shall be an outlet provided for the tank fill valve. If there are any additional options selected (such as an extra tank suction or direct tank inlets), there shall be additional outlets provided to accommodate these items.

**Ladder Compartment through Booster Tank - Horizontal**

*LADDER COMPARTMENT*

The ground ladders shall be stored within a compartment installed through the booster tank.

All items shall be stored in their own independent section to allow one item to be removed without disturbing another. There shall be polypropylene slide angles installed in each section where applicable, and for the ladders to slide on. There shall be a stop in the front of each section to prevent the items from sliding forward.

**Ladder Compt Made of 1/8" Smooth Aluminum**

*LADDER COMPARTMENT MATERIAL*

The ground ladder compartment shall be fabricated of .125-inch smooth aluminum.

**Compartment THROUGH -THE- TANK - Horizontal**

*LADDER COMPARTMENT LOCATION*

The ground ladder compartment shall be located horizontally through the water tank.

**Compt. open in pump compartment**

*LADDER COMPARTMENT OPEN END*

The compartment shall be enclosed through the tank and open at the pumphouse end; where "stops" will be incorporated to prevent the ladders from sliding forward and damaging internal pumphouse components.

**Ladder Compt. Door Hinge location -Top-**

*LADDER COMPARTMENT DOOR HINGE LOCATION*

The door hinge shall be mounted horizontally across the top edge of the compartment door opening and a gas shock hold open device shall be installed to hold the door in the "Open" position.
Ladder Compartment Door, (Door Matches Rear Overlay) STD

LADDER COMPARTMENT DOOR

The door material shall match the rear overlay material. The door shall have two (2) push button type latches installed with a chrome handle centered between the push button latches.

If the door is not properly closed and the parking brake is released, it shall activate the “hazard light” in the cab to alert the crew.

Reflective Chevron Material on Ladder Compartment Door

LADDER COMPARTMENT DOOR REFLECTIVE CHEVRON

The ladder compartment door shall be left unfinished and include retro-reflective chevron material matching the rear of the apparatus.

Duo Safety Ladders for Ladder Compartments-Supplied Ladders

LADDER COMPLIMENT

The following ladders shall be supplied with the apparatus:

- Duo Safety 24’ Alum 900A 2 sect
  One (1) Duo-Safety 24 foot (7.0 m) two (2) section aluminum extension ladder(s), model 900A.

- Duo Safety 14’ Alum 775A roof
  One (1) Duo-Safety 14 foot (4.0 m) aluminum roof ladder(s) with folding hooks, model 775A.

- Duo Safety 10’ Alum 585A attic
  One (1) Duo-Safety 10 foot (3.0 m) aluminum attic ladder(s), model 585A.

(2) Pike Poles Metal Storage Tubes - Fire Department Supplied Pike Poles

PIKE POLE STORAGE

There shall be two (2) tubes provided for storage of the pike poles installed with the ground ladder compliment.

The pike poles shall be supplied and installed by the Fire Department before the apparatus is placed into service.

(2) Suction Hose Carriers-6” x 10’-(1) LS and (1) RS Catwalk

SUCTION HOSE STORAGE

Suction hose shall be stored on a formed carrier rack sized to hold 6.00 inch x 10.00 foot hose. The rack shall have two (2) Velcro hold-down straps, one (1) at each end, which shall secure the suction hose to the tray.

One (1) carrier shall be mounted to the catwalk on each side of the apparatus above the side compartments.

Suction Hose Carrier - Anodized Aluminum

SUCTION HOSE STORAGE MATERIAL

Each suction hose rack shall be constructed of anodized aluminum for a durable, long lasting finish.

(2) Suction Hose for Carrier-Provided-6” x 10’

SUCTION HOSE

The following suction hose shall be provided with the carriers.

{Qty} 6” x 10’ w/ lightweight cplg - Clear PVC

There shall be Two (2) 10 foot length(s) of 6.00 inch clear PVC suction hose with lightweight couplings provided with the above specified storage.

Vertical Unistrut (ALL) Body Compartments, Pumper (includes rear)

COMPARTMENT UNISTRUT

Vertically mounted Unistrut shall be installed in all apparatus body compartments, in the upper and lower sections, to
accommodate the installation of shelves, trays, and other miscellaneous equipment.

**OVER-WHEEL COMPARTMENT PARTITIONS**

Compartment partitions fabricated of the same material as the body shall be permanently installed in the left over-wheel compartment, right over-wheel compartment, or both where applicable by design.

The partitions shall be permanently installed in place and flush to the forward and rearward frame openings.

The partitions shall aid in keeping loose equipment from falling into the fore and aft compartments.

**SHELVING**

The shelving shall be made out of .190 inch (4.83 mm) smooth aluminum sheet material with a formed 2.00 inch (50.80 mm) lip on the front and back.

The side mounting brackets shall be provided for vertical adjustment.

Standard manufacture shelf construction capacity ratings are as follows, any requested change to the manufacture’s standard design may affect/reduce the ratings accordingly:

Shelving shall be rated at a capacity of 200 pounds (90.72 kg) and applicable to the design configuration.

The following shelving shall be provided:

- **UPPER FULL DEPTH SHELVING**
  - A full width x full depth shelf shall be provided and installed in the upper area of the compartment as specified.
  - There shall be a total quantity of three (3) provided.
    - **Qty** L-1 Compartment
      - One (1) located in the L-1 compartment.
    - **Qty** L-2 Compartment
      - One (1) located in the L-2 compartment.
    - **Qty** R-1 Compartment
      - One (1) located in the R-1 compartment.
    - **Qty** R-2 Compartment
      - One (1) located in the R-2 compartment.
    - **Qty** R-3 Compartment
      - One (1) located in the R-3 compartment.

- **LOWER FULL DEPTH SHELVING**
  - A full width x full depth shelf shall be provided and installed in the lower area of the compartment as specified.
  - There shall be a total quantity of two (2) provided.
    - **Qty** L-1 Compartment
      - One (1) located in the L-1 compartment.
    - **Qty** R-3 Compartment
      - One (1) located in the R-3 compartment.
Roll-Out Tray Package- Pumpers/Dryside Tanker

**ROLL OUT TRAY(S)**

Each tray shall be fabricated of .19 inch (4.83 mm) thick 3003 grade or higher aluminum sheet material with four (4) 3.00 inch (76.20 mm) side flanges, corner welded for maximum strength and shall be as wide and as deep as compartment allows.

The following shall be supplied:

{(Qty) Floor Mount Roll Out -Full Width-(Austin 300#/100% w/Front Drawer Release)}

**ROLL-OUT ASSEMBLY/AUSTIN**

The floor mounted tray shall be full width and shall be secured to an Austin Hardware 22.00 inch (558.80 mm) long ball bearing "heavy duty" slide assembly. The slide assemblies shall incorporate cadmium plated ball bearing roller slides and a lock-in, lock-out front drawer release system (FDR).

The tray shall have a 300# capacity and 100% extension.

There shall be a total quantity of three (3) provided.

{(Qty} L-1 Compartment
- One (1) located in the L-1 compartment.

(Qty} R-3 Compartment
- One (1) located in the R-3 compartment.

{(Qty} B-1 Rear Ctr Compartment
- One (1) located in the rear center compartment.

{(Qty} Roll Out/Tilt Down Tray-FW-25"D-SlideMaster-250#/90% Ext Adjustable

**ROLL OUT/TILT DOWN TRAY**

The roll out/tilt mounted tray shall be full width and depth and shall be secured to a (Slide Master) roll-out system. The slide unit shall extend down 30-degrees and 90% extension with a 250# slide capacity. The slide assemblies shall incorporate cadmium plated ball bearing roller slides and a latching device to hold the tray in the stored position.

The roll out tilt tray assembly shall be mounted to the unistrut of the compartment specified so that it is vertically adjustable.

There shall be a total quantity of five (5) provided.

Twist Lock -SlideMaster Slide-
Each slide shall be held in the locked position by a lever actuated twist lock.

Silver Wet Painted SlideMaster Slide
Each Slide Master slide shall be wet painted {silver} in color.

{(Qty} L-1 Compartment
- One (1) located in the L-1 compartment.

{(Qty} L-2 Compartment
- One (1) located in the L-2 compartment.

{(Qty} R-1 Compartment
- One (1) located in the R-1 compartment.

{(Qty} R-2 Compartment
- One (1) located in the R-2 compartment.

{(Qty} R-3 Compartment
- One (1) located in the R-3 compartment.
An aluminum pull-out tool board with DA finish shall be installed in the compartment as specified. The tool board shall be attached to unistrut material mounted on the floor and ceiling of the compartment, extending perpendicular to the rear wall, allowing for horizontal adjustment from front to rear.

The tool board shall be mounted utilizing an Austin Hardware slide with locking device at the bottom to keep the board in the stored and extended positions.

There shall be a total quantity of two (2).

Red-reflective striping on tool board
The pull-out/swing-out style tool board shall have RED reflective striping installed making the perimeter of the tool board more readily visible.

Two (2) located in the L-3 compartment.

Compartment to Hold Inflatable Air Bags—Horizontal storage
Inflatable air bags shall be stored in individual horizontal storage slots of a compartment. Each slot shall be wide enough to accommodate the specified bag dimensions with fill valve. The air bags shall be removable without disturbing the storage of another.

The compartment shall have provisions for the following air bags:

- (2) 24x24, (2) 20x20, (2) 15x15, (2) 12x12, (1) 6x12
  - Two (2) 24.00 inch by 24.00 inch by .875 inch bags
- Two (2) 20.00 inch by 20.00 inch by .875 inch bags
- Two (2) 15.00 inch by 15.00 inch by .875 inch bags
- Two (2) 12.00 inch by 12.00 inch by .875 inch bags
- One (1) 6.00 inch by 12.00 inch by .875 inch bags

The air bag compartment shall be located forward in the B-1 compartment.

Velcro Strapping (heavy duty)
The air bag compartment shall incorporate heavy duty Velcro strapping to securely retain the equipment during transit.

The lowest edge of the apparatus body side compartments shall be trimmed with brightly anodized aluminum channel rub rail material.

The rub rails shall be approximately 3.00 inches high with flanges turned outwards for increased rigidity, with each end chamfered to a 45 degree angle. The rub rails shall not be constructed as an integral part of the apparatus body structure, allowing each rub rail to be easily removed in the event of damage.

The rub rails shall be secured with stainless steel fasteners and spaced away from the apparatus body with .50 inch nylon spacers to help absorb moderate side impacts and prevent the collection of water and debris for easier cleaning.
FOLDING STEPS, CPI Illuminated LED-Pumper/Dryside Tanker  {DELETE IF NOT REQUI
Y___N___
Y___N___
Y___N___
Y___N___
Y___N___
Y___N___
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Y___N___
FOLDING STEPS

Cast Products, Inc. model #SP6610-1CH dual LED illuminated folding steps, made of high strength die cast aluminum with a protective chromed coating, pyramid tread platform, conforming to current NFPA requirements, shall be provided and installed on the apparatus as specified.

The steps shall have a minimum of 46 sq. inches of surface area capable of sustaining a 1200 lb. static load. The steps shall be mounted no more than 18" inches between each step.

Four (4) Left Forward Steps

STEP LOCATION

Four (4) folding steps shall be installed on the left forward vertical wall of the front compartment.

(1) 10" Handrails, knurled Alum/LED - above forward steps

10" HANDRAILS

One (1) 10.00 inch long by 1.25 inch diameter handrail constructed of extruded aluminum with a knurled grip, full length red reflective strip and full length illuminated LED light strip shall be installed in a location above the forward step(s) and in accordance with (NFPA) 1901, Standard for Automotive Fire Apparatus, standard requirements. There shall be a minimum of 2.00 inches of clearance between the bracket and the body.

Handrail Illumination Light Color  (White/Clear)
Each handrail LED light strip specified shall be white/clear in color.

Illuminated Handrail Activation - Park Brake

ILLUMINATED HANDRAIL LIGHTING ACTIVATION

The illuminated handrail light shall be activated when the park brake is set.

Step Light Activation - Park Brake

STEP LIGHT ACTIVATION

The step light shall be activated when the park brake is set.

Three (3) Left Rear Steps

STEP LOCATION

Three (3) folding steps shall be installed on the left rear vertical face of the body.

(1) 10" Handrails, knurled Alum/LED - above rear steps

10" HANDRAIL

One (1) 10.00 inch long by 1.25 inch diameter handrail constructed of extruded aluminum with a knurled grip, full length red reflective strip and full length illuminated LED light strip shall be installed in a location above the rearward step(s) and in accordance with (NFPA) 1901, Standard for Automotive Fire Apparatus, standard requirements. There shall be a minimum of 2.00 inches of clearance between the bracket and the body.

Handrail Illumination Light Color  (White/Clear)
Each handrail LED light strip specified shall be white/clear in color.

Illuminated Handrail Activation - Park Brake

ILLUMINATED HANDRAIL LIGHTING ACTIVATION

The illuminated handrail light shall be activated when the park brake is set.

Step Light Activation - Park Brake

STEP LIGHT ACTIVATION

The step light shall be activated when the park brake is set.
Bolt On Intermediate Rear Step - Extruded Stair Tread "Diamondback" Pumper/Tanker

**INTERMEDIATE REAR STEP**

The rear step shall be 8.00 inches (203.20 mm) in depth.

The step shall be constructed of a 7.00 inch (177.80 mm) wide piece of extruded stair tread "Diamondback" grip material and spaced away from the back of the body 1.00 inch (25.40 mm) to provide an 8.00 inch (203.20 mm) deep stepping surface.

The step shall be mounted on the flat back of the apparatus with gusset-type mounting to provide sufficient support for loading and deploying hose and for gaining access to the hose bed area.

**Intermediate Rear Step - Located below Hose Bed & hand rail-high as possible**

**INTERMEDIATE REAR STEP LOCATION**

The rear step shall be located as high as possible beneath the hose bed floor and the horizontal hand rail specified.

(1) Step Lighting, LED Tube 9"

**STEP LIGHTING**

One (1) light shall be installed to illuminate the stepping areas as provided. The light shall be a LED Tube light model #RX-15T16-5050-21CM with an aluminum mounting bezel.

The light shall be directed towards and positioned above the stepping surfaces.

Step Light Activation - Park Brake

**STEP LIGHT ACTIVATION**

The step light shall be activated when the park brake is set.

HANDRAILS - Knurled Alum/Illuminated LED - pumper/tanker/rescue

**HANDRAILS KNURLED ALUMINUM ILLUMINATED**

Handrails shall be 1.25 inches in diameter, constructed of extruded aluminum with a knurled grip, full length red reflective strip and full length illuminated LED light strip.

There shall be a 2.00 inch minimum clearance between the handrail and the body. The light shall illuminate an area adjacent to the handrail and in accordance with (NFPA) 1901, Standard for Automotive Fire Apparatus, standard requirements.

The following handrails shall be installed at the approximate lengths noted:

(Set of 3 Rear) - Knurled Alum/Illuminated LED-

**REAR HANDRAIL LOCATION**

Three (3) handrails shall be installed on the rear of the apparatus. Each handrail shall be of an adequate length, as available usable space allows, to provide a suitable gripping area for personnel.

Two (2) vertical handrails shall be installed, one on each side, just below the hose bed sides. The remaining handrail shall be installed horizontally, just below the hose bed area.

Handrail Illumination Light Color (White/Clear)

Each handrail LED light strip specified shall be white/clear in color.

Illuminated Handrail Activation - Park Brake

**ILLUMINATED HANDRAIL LIGHTING ACTIVATION**

The illuminated handrail light shall be activated when the park brake is set.

DUAL Tow Eyes Below Rear Compt - 1 ea side (Black Color)

**TOW EYES**
There shall be two (2) rear tow eyes installed to the frame rails, one each side, accessible below the rear of the apparatus.

They shall be manufactured of 1.00 inch plate steel and each plate shall be bolted to the chassis frame rail with a minimum quantity of six (6) grade 8 bolts. The two plates shall be anchored together with 1.00 inch steel tubing to prevent swaying of the frame rails during a towing operation. All steel components shall be painted black.

Multiplex Body Low Voltage Electrical System, Pumper

LOW-VOLTAGE ELECTRICAL SYSTEM

The apparatus shall be equipped with a Logic Controlled, Low-Voltage (12v) Electrical System, compliant with the latest revision of the (NFPA) 1901, Standard for Automotive Fire Apparatus.

The system shall be capable of performing total load management, load management sequencing, and load shedding via continuous monitoring of the low-voltage electrical system. In addition, the system shall be capable of switching loads (similar to operating as an emergency warning lamp flasher) eliminating the dependency on many archaic electrical components such as conventional flasher modules. The system shall also incorporate provisions for future expansion or system modification.

The low-voltage electrical system shall be designed to distribute the placement of electrical system hardware throughout the apparatus thereby enabling a smaller, optimized wire harness. The programmable, logic controlled system shall eliminate redundant electrical hardware such as extra harnesses, circuit boards, relays, circuit breakers, and separate electrical or interlock subsystems and associated electronics for controlling various electrical loads and inputs.

As-built electrical system drawings and an apparatus-specific reference of I/O shall be furnished in the final delivery manuals. These drawings shall illustrate the electrical system broken down into separate functions, or small groups of related functions. Drawings shall depict circuit numbers, electrical components and connectors from beginning to end. A single drawing for all electrical circuits installed by the apparatus manufacturer shall not be accepted.

Node (Horizontal Mount) Pumper

NODE

An electrical distribution node or relay shall be installed in the below locations of the apparatus body.

The pump node shall be mounted as high as practical in the full depth portion of the right front compartment.

The rear body nodes shall be mounted as high and as far rearward as practical on the back wall of the rearmost compartment.

A protective cover shall be installed to prevent damage to the node or electrical system during equipment installation and or removal. Node covers shall be approximately 16.00 to 22.00 inches in length with an inspection hole positioned for view of the node indicator LED lights. The finish of the cover shall match the compartments interior finish. Node covers will not include any type of shelf mounting structure and shall limit the height of unistrut or shelf height within the compartments.

Underbody Lights (4) - Walkway/Tailboard-Top Mount ONLY

PERIMETER LIGHTS LOCATION

There shall be four (4) underbody perimeter lights installed on the apparatus positioned to provide illumination to the immediate ground area around the unit.

One (1) under each side of the walkway and two (2) under the rear tailboard.

TecNiq T44 Series, 4" Rd LED Underbody Lights

PERIMETER LIGHTS

The underbody perimeter lights provided will be TecNiq model T44 series, 4" round, 8 diode LED lights.

Underbody Perimeter Light Activation-Match Chassis Programming

PERIMETER LIGHTS ACTIVATION

The perimeter lights under the body shall illuminate the area with the activation of the chassis ground lights.
Whelen Upper Lighting Package

UPPER LIGHTING PACKAGE

The following NFPA lighting package, manufactured by Whelen, shall be supplied and installed in the upper areas of the vehicle.

Zone C (2) L31H LED Beacons

UPPER ZONE C:

There shall be two (2) Whelen model L31H*FN beacons with 360 degree LED lights, provided and installed on the apparatus.

One (1) each side on the rear upper outboard corners of the apparatus.

Rear Lights are Red with Red Lenses

REAR WARNING LIGHTS COLOR

The upper warning lights mounted at the rear shall be red with red lenses.

(2) Cast Aluminum Upper Zone C Light Stanchions

CAST ALUMINUM LIGHT STANCHIONS

Two (2) light stanchions shall be mounted in the upper rear corners of the body sides, one each side. Each shall be large enough to accommodate an upper zone C rotating beacon and a hose bed light if specified. The DOT lights specified elsewhere in the quote shall also be located one on the side and the other located on the rear of each stanchion.

Upper Rear Lights Switched w/E-Master & Secondary Switch (VISTA DISPLAY)

UPPER REAR WARNING LIGHT SWITCH E-MASTER/VISTA

The upper rear warning lights shall be controlled through the master warning switch and a secondary rear warning switch located on the Vista display control screen. The switches shall be clearly labeled for ease of identification.

Whelen Lower LED Lighting Package (KNOW REQUIREMENTS/QTYS)

LOWER LED WARNING LIGHTING

The following NFPA lighting package, manufactured by Whelen, shall be supplied and installed in the lower areas of the vehicle.

Zone B&D - (4) Whelen C6 SurfaceMax Series Super-LED, Chrome Bezels

LOWER ZONE B&D:

There shall be four (4) Whelen model C6 SurfaceMax series Super-LED lights with chrome bezels, two (2) each side, provided and installed with the apparatus.

Side Lights Standard Flash

SIDE WARNING LIGHTS FLASH

The lower side lights shall feature multiple flash patterns including steady burn.

Side Lights are Red with Red Lenses

SIDE WARNING LIGHTS COLOR

The lower side warning lights mounted on the side positions shall be red with red lenses.

(4) Side Lights Located- Pumphouse/Rear Tailboard

SIDE WARNING LIGHTS LOCATION

The warning lights on the side of the apparatus shall be mounted at the pump panel location and at the rear tailboard location.
A cast aluminum angled light housing shall be used for the rearmost warning light in zones B&D to ensure the light is mounted as far rearward as possible on the tailboard.

The lower side warning lights shall be controlled through the master warning switch and a secondary side warning switch located on the Vista display control screen. The switches shall be clearly labeled for ease of identification.

There shall be two (2) Whelen model C6 SurfaceMax series Super-LED lights with chrome bezels, one (1) each side, on provided and installed on the rear of the body.

The following shall be installed in the order as specified from top to bottom:

One (1) #C6BTT LED red brake/tail light
One (1) #C6T LED amber turn signal light populated in the shape of an arrow
One (1) #C6BU LED clear back-up light

There shall be Whelen 4-position vertical chrome plated housing provided for each tail light assembly.

The upper most open cavity shall be filled with the specified warning light for the rear of the apparatus.

The tail lights mounted at the rear shall have colored lenses to match the color of the optics.
Backup Lights to illuminate in reverse only

**BACKUP LIGHTS**

The backup lights shall illuminate when the apparatus is placed in reverse.

Weldon RED DOT Lighting - (7 total LED) - Lights high at rear

**LED DOT LIGHTING**

There shall be seven (7) lights located on the rear of the apparatus. Three (3) of the lights shall be mounted on the rear of the apparatus center location, for use as identification lamps. Two (2) additional lights shall be located on the rear outboard locations, one (1) each side as high as possible. Two (2) lights shall be mounted on the sides facing the side at the rear corners, for use as clearance lamps.

The lights shall be Weldon brand 9186-1500 series LED red markers.

(1 per side) Weldon Intermediate Amber Lighting (Req. for apparatus >30')

**DOT ADDITIONAL MARKER LIGHTS**

There shall be two (2) amber LED intermediate marker lights/intermediate turn signals installed in the rub rail, forward of the rear wheel well, one (1) each side.

The lights shall be Weldon brand 9186-1500 series LED amber markers/turn.

Intermediate Turn Signals (mid turn, flash with turn signal)

**INTERMEDIATE TURN SIGNALS**

The intermediate turn signals will flash with the turn indicators.

Rear camera surface mount center rear of body (Chassis Provided Camera)

**REAR VIEW CAMERA LOCATION**

A camera shipped loose with the chassis shall be surface mounted at the center location on the rear of the apparatus body for maximum viewing capability. A protective shroud shall be installed over the system to protect against damage.

NO AUX Camera Monitor/ Camera System

(Qty) Accessory 12V Power located in EMS Cabinet on Left Side Wall

**ACCESSORY POWER LOCATION**

In the EMS cabinet, on the left side wall, there shall be accessory power.

There shall be a total of one (1) provided.

Power & Ground Studs- 12-Volt -40 amp

**12 VOLT POWER**

A set of power and ground studs shall be provided for the 12 volt power. The power and ground studs shall be circuit breaker protected. The studs shall be capable of carrying up to a 40 amp battery direct load.

(Qty) Accessory 12V Power Location - L1-forward wall

**ACCESSORY POWER LOCATION**

In the L-1 body compartment, on the forward wall, there shall be accessory power.

There shall be a total of one (1) provided.

Power & Ground Studs- 12-Volt -40 amp

**12 VOLT POWER**

A set of power and ground studs shall be provided for the 12 volt power. The power and ground studs shall be circuit breaker protected. The studs shall be capable of carrying up to a 40 amp battery direct load.
(2) Stationary Scene lights located side of body, one each side rear corner  

SIDE SCENE LIGHT LOCATION

There shall be two (2) scene lights installed on the body side of the apparatus, one (1) on each side at the rear corner of the body side walls.

Whelen 900 Series Super-LED, Gradient Scene Light, Chrome Flange  

SCENE LIGHT MODEL

Whelen model #9SC0ENZR LED gradient scene lighting with chrome flange shall be surface mounted on the apparatus.

Each light shall offer LED lighting at a gradient 32-degree angle. The lamp shall draw 6 amps and generate 6,500 lumens.

Body Side Scene light(s) switched with chassis side lights (stationary)  

BODY SIDE SCENE LIGHT ACTIVATION

The scene lighting shall be activated with the chassis side scene lights.

(2) Stationary Scene lights located back of body, one each side  

REAR SCENE LIGHT LOCATION

There shall be two (2) scene lights installed on the rear facing vertical surface of the body, one (1) on each side.

Whelen 900 Series Super-LED, Gradient Scene Light, Chrome Flange  

SCENE LIGHT MODEL

Whelen model #9SC0ENZR LED gradient scene lighting with chrome flange shall be surface mounted on the apparatus.

Each light shall offer LED lighting at a gradient 32-degree angle. The lamp shall draw 6 amps and generate 6,500 lumens.

Rear Scene light(s) switched on the VISTA (SELECT VISTA IN SPARCON) (stationary)  

REAR SCENE LIGHT ACTIVATION

The rear scene lighting shall be activated by a virtual button on the ‘VISTA’ display control screen. The scene shall also be interlocked with the park brake.

The switch shall be labeled as follows:

Rear Scene

(2) Top Mount Telelights -Mount Down Forward Tubes Pump Compt (SC or TC)  

TELELIGHT LOCATION

The specified telelights shall be mounted in the rearward corner tubes of the pump compartment, one (1) each side, towards the chassis cab.

Whelen Pioneer Super-LED w/sgl fld (PFH1P) top mt/top raise, White Housing  

SCENE LIGHT MODEL

Whelen Pioneer model #PFH1P series LED top mount, top raise telescoping scene light with white housing shall be provided on the apparatus.

Each lamp head shall have one (1) 12v Super-LED® panel at 75 watts total. The light head shall draw 6.5 amps and generate 12,000 lumens. Each lamp head shall be no more than 4.25 inches in height by 8.35 inches in width.

"Up" Indicator Switch on the Light Pole(s)  

INDICATOR LIGHT FOR RAISED POSITION

The scene light pole shall be equipped with an "up" indicator switch. When the parking brake is released, it shall activate the hazard light in the cab to warn the crew if the light is in the raised position.
Body Side Scene light(s) switched on the rocker panel-Individual Switches Y__N__

**BODY SIDE SCENE LIGHT ACTIVATION**

The scene lighting shall be activated by two (2) rocker switches located on the switch panel in the cab, one (1) for each side of the apparatus.

The switches shall be labeled as follows:

Left Scene

Right Scene

Reflective Stripe - 1" x 4" x 1" Y___N___

**REFLECTIVE STRIPING**

There shall be a 4.00 inch (101.60 mm) reflective stripe with two (2) 1.00 inch (25.40 mm) accent stripes applied to the chassis and apparatus body as specified:

Stripe to be applied in a 'Straight Line' Pattern Y___N___

**STRIPE PATTERN**

The reflective striping shall be applied around the perimeter of the apparatus in a straight line pattern.

Stripe to be White Y___N___

**STRIPE COLOR**

The reflective striping shall be white in color.

Diamond Grade Retro-reflective Chevron Striping (REAR) Pumper/Rescue Y___N___

**REAR RETRO-REFLECTIVE CHEVRON STRIPING**

A minimum of 50 percent of the rear-facing vertical surface, visible from the rear of the apparatus, shall be equipped with Diamond Grade, retro-reflective striping in a chevron pattern, sloping downward and away from the centerline of the vehicle at an angle of 45-degrees.

The stripe shall be 6.00 inches (152.40 mm) wide alternating in colors in compliance with (NFPA) 1901, Standard for Automotive Fire Apparatus.

Striping to be Red/Fluorescent Yellow-Green Y___N___

**CHEVRON COLOR**

The retro-reflective chevron striping shall be red and fluorescent yellow-green in color.

Reflective Body/Cab Lettering max 20 letters - 10" Y___N___

**REFLECTIVE LETTERING**

Reflective letters shall be provided and installed on the apparatus as directed by the Fire Department. A maximum total of twenty (20) letters up to 10.00 inches (254.00 mm) high shall be provided.

22k Sign Gold - Body/Cab - max 60 letters-6" Y___N___

**22K SIGN GOLD LETTERING**

22k Sign Gold adhesive Scotchcal lettering with black shadowing and edging shall be provided and installed the apparatus body as directed by the Fire Department. A maximum total of sixty (60) letters up to 6.00 inches (152.4 mm) high shall be provided.

Fire Department Installed Decals Y___N___

**FIRE DEPARTMENT SUPPLIED DECALS**

The apparatus decals shall be provided and installed by the Fire Department after final delivery of the completed apparatus.
License Plate Mounting Options

**LICENSE PLATE MOUNTING**

CPI Cast Aluminum License Plate Bracket (fully enclosed) w/ LED Light

A Cast Products, model LP0004-1-B, cast aluminum fully enclosed license plate bracket shall be installed. The bracket shall incorporate a clear LED light (WL0501) to illuminate the license plate and meet DOT requirements.

License Plate Bracket Location Right Side

**LICENSE PLATE BRACKET LOCATION**

The above specified license plate bracket shall be installed at the back of the apparatus on the right side. The bracket shall be mounted to meet all applicable DOT standards.

Equipment, Pumper/Tanker

**MISCELLANEOUS EQUIPMENT**

The following equipment list shall be provided with the completed apparatus.

1 Set Zico Folding Wheel Chocks, #SAC-44-E (WATCH MTS, USE SMRT STRG IF APPLY)

**WHEEL CHOCKS**

One (1) set of NFPA compliant Ziamatic folding wheel chocks model # SAC-44-E shall be supplied with the apparatus.

(1-set) Zico Folding Wheel Chock - horiz mounting brckts-LF body - #SQCH-44-H

**ZICO WHEEL CHOCK MOUNTING BRACKETS**

One (1) set of Ziamatic folding wheel chock underbody horizontal mounts, model # SQCH-44-H, shall be installed on the apparatus under the body in front of the rear wheels on the left side.

Fire Department Supplied Fire Extinguishers

**EXTINGUISHERS**

All NFPA required fire extinguishers will be supplied and installed by the Fire Department before the apparatus is placed into service.

{Qty} Streamlight Fire Vulcan - LED Rechargeable Lantern

**RECHARGABLE FLASHLIGHTS**

A hand held Streamlight Fire Vulcan HazLo Atax 180 series LED rechargeable lantern, model #44451 (orange) with quick release shoulder strap and charge rack shall be installed on the apparatus.

There shall be a total quantity of two (2) provided.

{Qty} Mount in Crew Area of the Cab

**MONITOR TOP**

One (1) XFT-NJ 1250 Crossfire Monitor Top with XFSS5 Stream Shaper and MST-4NJ 2.5” Stacked Tips (or documented equivalent) shall be provided and installed on the apparatus.

**THERMAL IMAGING CAMERA**

One (1) FLIR K65 (or documented equivalent) with the charge rack shall be provided and installed on the apparatus.

**WIRELESS HEADSETS**

Four (4) Setcom Liberator Max wireless headsets (or documented equivalents) shall be provided and installed for each seated position.
Flares  

**FLARES**

Fire Department Supplied Flares  

Y___N___

All NFPA required flares will be supplied and installed by the Fire Department before the truck is placed into service.

Traffic Cones  

**TRAFFIC CONES**

Fire Department Supplied Traffic Cones  

Y___N___

All NFPA required traffic cones will be supplied and installed by the Fire Department before the truck is placed into service.

Traffic Vest  

**TRAFFIC VEST**

Fire Department Supplied Traffic Vest  

Y___N___

All NFPA required traffic vest will be supplied and installed by the Fire Department before the truck is placed into service.

AED  

**AED (AUTOMATIC EXTERNAL DEFIBRILLATOR)**

Fire Department Supplied AED  

Y___N___

All NFPA required AED units will be supplied and installed by the Fire Department before the truck is placed into service.

First Aid Kit  

**FIRST AID KIT**

Fire Department Supplied First Aid Kit  

Y___N___

All NFPA required First Aid Kits will be supplied and installed by the Fire Department before the truck is placed into service.

Salvage Covers  

**SALVAGE COVERS**

Fire Department Supplied Salvage Covers  

Y___N___

All NFPA required salvage covers will be supplied and installed by the Fire Department before the truck is placed into service.

Axes  

**AXES**

Fire Department Supplied Axes  

Y___N___

All NFPA required Axes will be supplied and installed by the Fire Department before the truck is placed into service.

Spanner Wrenches  

**WRENCH SETS**

Fire Department Supplied Spanner & Hydrant Wrenches  

Y___N___

All NFPA required spanner and hydrant wrenches will be supplied and installed by the Fire Department before the truck is placed into service.

Nozzles  

**NOZZLES**

Fire Department Supplied Nozzles  

Y___N___

All NFPA required nozzles will be supplied and installed by the Fire Department before the truck is placed into service.

Hand Held Tools, Pumpers/Tanker/Rescues  

**HAND HELD TOOLS**

Y___N___
Claw Tool

CLAW TOOL

Fire Department Supplied Claw Tool

All NFPA required claw tools will be supplied and installed by the Fire Department before the truck is placed into service.

Halligan Tool

HALLIGAN TOOL

Fire Department Supplied Halligan Tool

All NFPA required Halligan tools will be supplied and installed by the Fire Department before the truck is placed into service.

Crowbars

CROW BAR

Fire Department Supplied Crowbar

All NFPA required crowbars will be supplied and installed by the Fire Department before the truck is placed into service.

Sledge Hammer

SLEDGE HAMMER

Fire Department Supplied Sledge Hammer

All NFPA required sledge hammers will be supplied and installed by the Fire Department before the truck is placed into service.

Rubber Mallet

RUBBER MALLET

Fire Department Supplied Rubber Mallet

All NFPA required rubber mallets will be supplied and installed by the Fire Department before the truck is placed into service.

Shovels

SHOVELS

Fire Department Supplied Shovels

All NFPA required shovels will be supplied and installed by the Fire Department before the truck is placed into service.

Bolt Cutter

BOLT CUTTER

Fire Department Supplied Bolt Cutter

All NFPA required bolt cutters will be supplied and installed by the Fire Department before the truck is placed into service.

Supply Hose

SUPPLY HOSE

Fire Department Supplied Fire Hose

All NFPA required fire hose will be supplied and installed by the Fire Department before the truck is placed into service.

Adaptors

ADAPTORS

Fire Department Supplied Adaptors

All NFPA required Adaptors will be supplied and installed by the Fire Department before the truck is placed into service.

SCBA & Cylinders

SCBA & CYLINDERS (air packs)

Fire Department Supplied SCBA

All NFPA required SCBA and Cylinders will be supplied and installed by the Fire Department before the truck is placed into service.
2.3 CHASSIS SPECIFICATIONS

**MODEL**

The chassis shall be a Metro Star model. The cab and chassis shall include design considerations for multiple emergency vehicle applications, rapid transit and maneuverability. The chassis shall be manufactured for heavy duty service with the strength and capacity to support a fully laden apparatus, one hundred (100) percent of the time.

**MODEL YEAR**

The chassis shall have a vehicle identification number that reflects a 2022 model year.

**COUNTRY OF SERVICE**

The chassis shall be put in service in the country of United States of America (USA).

The chassis will meet applicable U.S.A. federal motor vehicle safety standards per CFR Title 49 Chapter V Part 571 as clarified in the incomplete vehicle book per CFR Title 49 Chapter V Part 568 Section 4 which accompanies each chassis. Spartan Chassis is not responsible for compliance to state, regional, or local regulations. Dealers should identify those regulations and order any necessary optional equipment from Spartan Chassis or their OEM needed to be in compliance with those regulations.

**CAB AND CHASSIS LABELING LANGUAGE**

The cab and chassis shall include the applicable caution, warning, and safety notice labels with text to be written in English. All applicable caution, warning, and safety notice labels shall be Innovative Controls brand. Where applicable to the location within the specific layout and label package of the cab and chassis, the labels shall include decorative chrome bezels. Designs shall include bezels that fit individual labels or packaged configurations of labels in certain common locations.

The following labels shall be Innovative Controls brand, each including a decorative chrome bezel (where applicable):

- Shoreline
- Aerial Stowed
- Aerial Breakers 2
- Air Conditioner
- Cab Tilt Plate
- Air Compressor Breaker
- Battery Conditioner Breaker
- Helmet Caution
- Horn Tag
- Q2B Tag
- Load Center Plate
- Not a Step Label
- Occupancy Tag
- Do Not Move
- Occupants Must Be Seated
- Do Not Stand
- Danger Do Not Weld
- Danger--Untrained Operator
- Def Tag, including any additional labels selected in the 2907- subcat
- Battery Direct
- Kneeling
- IFS Air Fault
- Engine Brake
- Retarder
- LR 100 Amp Node
The apparatus shall be a pumper vehicle designed for emergency service use which shall be equipped with a permanently mounted fire pump which has a minimum rated capacity of 750 gallons per minute (3000 L/min). The apparatus shall include a water tank and hose body whose primary purpose is to combat structural and associated fires.

The chassis shall be manufactured for use as a straight truck type vehicle and designed for the installation of a permanently mounted apparatus behind the cab. The apparatus of the vehicle shall be supplied and installed by the apparatus manufacturer.

The angle of approach of the apparatus shall be a minimum of 8.00 degrees.

The chassis shall feature a 4 x 2 axle configuration consisting of a single rear drive axle with a single front steer axle.

The front gross axle weight rating (GAWR) of the chassis shall be 20,000 pounds. This front gross axle weight rating shall be adequate to carry the weight of the completed apparatus including all equipment and personnel.

The rear gross axle weight rating (GAWR) of the chassis shall be 27,000 pounds.
This rear gross axle weight rating shall be adequate to carry the weight of the completed apparatus including all equipment and personnel.

**PUMP PROVISION**

The chassis shall include provisions to mount a drive line pump in the middle of the chassis, behind the cab, more commonly known as the midship location. Chassis driveline pump provisions shall include an interlock feature for automatic setting of the park brake when the vehicle is shifted into pump mode while the transmission is in neutral and the transmission output speed translates to less than 1 mph. When the conditions are met the driver side parking brake valve shall activate. Once shifted to road mode the condition for electric automatic brake engagement is no longer present and the driver’s parking brake control valve shall function normally.

**WATER & FOAM TANK CAPACITY**

The chassis shall include a carrying capacity of 750 gallons (2839 liters) to 1250 gallons (4732 liters). The water and/or foam tank(s) shall be supplied and installed by the apparatus manufacturer.

**CAB STYLE**

The cab shall be a custom, fully enclosed, EMFD model with a 10.00 inch raised roof over the driver, officer, and crew area, designed and built specifically for use as an emergency response vehicle by a company specializing in cab and chassis design for all emergency response applications. The cab shall be designed for heavy-duty service utilizing superior strength and capacity for the application of protecting the occupants of the vehicle. This style of cab shall offer up to eight (8) seating positions.

The cab shall incorporate a fully enclosed design with side wall roof supports, allowing for a spacious cab area with no partition between the front and rear sections of the cab. To provide a superior finish by reducing welds that fatigue cab metal; the roof, the rear wall and side wall panels shall be assembled using a combination of welds and proven industrial adhesives designed specifically for aluminum fabrication for construction.

The cab shall be constructed using multiple aluminum extrusions in conjunction with aluminum plate, which shall provide proven strength and the truest, flattest body surfaces ensuring less expensive paint repairs if needed. All aluminum welding shall be completed to the American Welding Society and ANSI D1.2-96 requirements for structural welding of aluminum.

All interior and exterior seams shall be sealed for optimum noise reduction and to provide the most favorable efficiency for heating and cooling retention.

The cab shall be constructed of 5052-H32 corrosion resistant aluminum plate. The cab shall incorporate tongue and groove fitted 6061-T6 0.13 & 0.19 inch thick aluminum extrusions for extreme duty situations. A single formed, one (1) piece extrusion shall be used for the “A” pillar, adding strength and rigidity to the cab as well as additional roll-over protection. The cab side walls and lower roof skin shall be 0.13 inch thick; the rear wall and raised roof skins shall be 0.09 inch thick; the front cab structure shall be 0.19 inch thick.

The exterior width of the cab shall be 94.00 inches wide with a minimum interior width of 88.00 inches. The overall cab length shall be 137.10 inches with 60.00 inches from the centerline of the front of the axle to the back of the cab.

The cab interior shall be designed to afford the maximum usable interior space and attention to ergonomics with hip and legroom while seated which exceeds industry standards. The crew cab floor shall be flat across the entire walking area for ease of movement inside the cab.

The cab shall offer an interior height of 57.50 inches from the front floor to the headliner and a rear floor to headliner height of 65.00 inches in the raised roof area, at a minimum. The cab shall offer an interior measurement at the floor level from the rear of the engine tunnel to the rear wall of the cab of 57.88 inches. All interior measurements shall include the area within the interior trimmed surfaces and not to any unfinished surface.
The cab shall include a driver and officer area with two (2) cab doors large enough for personnel in full firefighting gear. The front doors shall offer a clear opening of 40.25 inches wide X 53.50 inches high, from the cab floor to the top of the door opening. The cab shall also include a crew area with up to two (2) cab doors, also large enough for personnel in full firefighting gear. The rear doors shall offer a clear opening of 32.25 inches wide X 61.00 inches high, from the cab floor to the top of the door opening.

The cab shall incorporate a progressive two (2) step configuration from the ground to the cab floor at each door opening. The progressive steps are vertically staggered and extend the full width of each step well allowing personnel in full firefighting gear to enter and exit the cab easily and safely.

The first step for the driver and officer area shall measure approximately 11.50 inches deep X 31.13 inches wide. The intermediate step shall measure approximately 8.50 inches deep X 32.50 inches wide. The height from the first step to the intermediate step and the intermediate step to the cab floor shall not exceed 11.00 inches.

The first step for the crew area shall measure approximately 11.50 inches deep X 20.44 inches wide. The intermediate step shall measure approximately 10.25 inches deep X 22.75 inches wide. The height from the first step to the intermediate step and the intermediate step to the cab floor shall not exceed 12.80 inches.

**OCCUPANT PROTECTION**

The vehicle shall include the Advanced Protection System™ (APS) which shall secure belted occupants and increase the survivable space within the cab. The APS shall selectively deploy integrated systems to protect against injuries in qualifying frontal impact, side impact, and rollover events. The increase in survivable space and security of the APS shall also provide ejection mitigation protection.

The system components shall include:

- Driver steering wheel airbag
- Driver dual knee air bags (patent pending) with energy management mounting (patent pending) and officer knee airbag.
- Large driver, officer, and crew area side curtain airbags
- APS advanced seat belt system - retractor pre-tensioners tighten the seat belts around the occupants, securing the occupants in seats and load limiters play out some of the seat belt webbing to reduce seat belt to chest and torso force upon impact as well as mitigate head and neck injuries
- Heavy truck Restraints Control Module (RCM) - receives inputs from the outboard sensors, selectively deploys APS systems, and records sensory inputs immediately before and during a detected qualifying event
- Integrated outboard crash sensors mounted at the perimeter of the vehicle - detects a qualifying front or side impact event and monitors and communicates vehicle status and real time diagnostics of all critical subsystems to the RCM
- Fault-indicating Supplemental Restraint System (SRS) light on the driver’s instrument panel

Frontal impact protection shall be provided by the outboard sensors and the RCM. In a qualifying front impact event the outboard sensors provide inputs to the RCM. The RCM activates the steering wheel airbag, driver side dual knee airbags (patent pending), officer side knee airbag, and advanced seat belts for each occupant in the cab.

Rollover, side impact, and ejection mitigation shall be provided by the outboard sensors and the RCM. In qualifying rollover or side impact events the outboard sensors provide inputs to the RCM. The RCM activates the side curtain airbags and advanced seat belts for each occupant in the cab. The RCM measures roll angle, lateral acceleration, and roll rate to determine if a rollover event or side impact event is imminent or occurring.
In the event of a qualifying offset or other non-frontal impact, the RCM shall determine and intelligently deploy the front impact protection system, the side impact protection system, or both front and side impact protection systems based on the inputs received from the outboard crash sensors.

**CAB FRONT FASCIA**

The front cab fascia shall be constructed of 5052-H32 Marine Grade, 0.13 of an inch thick aluminum plate which shall be an integral part of the cab.

The cab fascia will encompass the entire front of the aluminum cab structure from the bottom of the windshield to the bottom of the cab and shall be the “Classic” design.

The front cab fascia shall include two (2) molded plastic modules on each side accommodating a total of up to four (4) Hi/Low beam headlights and two (2) turn signal lights or up to four (4) warning lights. A chrome plated molded plastic bezel shall be provided on each side around each set of four lamps.

**FRONT GRILLE**

The front fascia shall include a box style, 304 stainless steel front grille 44.45 inches wide X 33.50 inches high X 1.50 inches deep. The grille shall include a minimum free air intake of 732.00 square inches. The upper portion of the grille shall be hinged to provide service access behind the grille.

**CAB UNDERCOAT**

There shall be a rubberized undercoating applied to the underside of the cab that provides abrasion protection, sound deadening and corrosion protection.

**CAB SIDE DRIP RAIL**

There shall be a drip rail along the top radius of each cab side. The drip rails shall help prevent water from the cab roof running down the cab side.

**CAB PAINT EXTERIOR**

The cab shall be painted prior to the installation of glass accessories and all other cab trim to ensure complete paint coverage and the maximum in corrosion protection of all metal surfaces.

All metal surfaces on the entire cab shall be ground by disc to remove any surface oxidation or surface debris which may hinder the paint adhesion. Once the surface is machine ground a high quality acid etching of base primer shall be applied. Upon the application of body fillers and their preparation, the cab shall be primed with a coating designed for corrosion resistance and surface paint adhesion. The maximum thickness of the primer coat shall be 2.00 mils.

The entire cab shall then be coated with an intermediate solid or epoxy surfacing agent that is designed to fill any minor surface defects, provide an adhesive bond between the primer and the paint and improve the color and gloss retention of the color. The finish to this procedure shall be a sanding of the cab with 360 grit paper followed by sealing the seams with SEM brand seam sealer.

The cab shall then be painted the specific color designated by the customer with an acrylic urethane type system designed to retain color and resist acid rain and most atmospheric chemicals found on the fire ground or emergency scene. The paint shall have a minimum thickness of 2.00 mils, followed by a clear top coat not to exceed 2.00 mils. The entire cab shall then be baked at 180 degrees for one (1) hour to speed the curing process of the coatings.

**CAB PAINT MANUFACTURER**

The cab shall be painted with Sikkens paint.
**CAB PAINT PRIMARY/LOWER COLOR**

The primary/lower paint color shall be:  

**CAB PAINT WARRANTY**

The cab and chassis shall be covered by a limited manufacturer paint warranty which shall be in effect for ten (10) years from the first owner’s date of purchase or in service or the first 100,000 actual miles, whichever occurs first.

The warranty details can be found in the chassis warranty document.

**CAB PAINT INTERIOR**

The visible interior cab structure surfaces shall be painted with an easy-to-clean gray texture finish.

**CAB ENTRY DOORS**

The cab shall include four (4) entry doors, two (2) front doors and two (2) crew doors designed for ease of entering and egress when outfitted with an SCBA. The doors shall be constructed of extruded aluminum with a nominal thickness of 0.13 inch. The exterior skins shall be constructed of 0.13 inch aluminum plate.

The doors shall include a double rolled style automotive rubber seal around the perimeter of each door frame and door edge which ensures a weather tight fit.

All door hinges shall be hidden within flush mounted cab doors for a pleasing smooth appearance and perfect fit along each side of the cab. Each door hinge shall be piano style with a 0.38 inch pin and shall be constructed of stainless steel.

**CAB ENTRY DOOR TYPE**

All cab entry doors shall be full length in design to fully enclose the lower cab steps. Entry doors shall include Pollak mechanical plunger style switches for electrical component activation.

**CAB INSULATION**

The cab ceiling and walls shall include a nonwoven polyester fiber insulation. The insulation shall act as a barrier absorbing noise as well as assisting in sustaining the desired climate within the cab interior.

**CAB STRUCTURAL WARRANTY**

Summary of Warranty Terms:

THE FOLLOWING IS SUMMARY OF WARRANTY TERMS FOR INFORMATION ONLY. THE ACTUAL LIMITED WARRANTY TERMS CAN BE FOUND IN THE CHASSIS WARRANTY DOCUMENT, WHICH CONTAINS THE COMPLETE STATEMENT OF THE WARRANTY. SPARTAN’S RESPONSIBILITY IS TO BE ACCORDING TO THE TERMS OF THE COMPLETE LIMITED WARRANTY DOCUMENT.

The cab structure shall be warranted for a period of ten (10) years or one hundred thousand (100,000) miles which ever may occur first. The warranty period shall commence on the date the vehicle is delivered to the first end user.
CAB TEST INFORMATION

The cab shall have successfully completed the preload side impact, static roof load application and frontal impact without encroachment to the occupant survival space when tested in accordance with Section 4 of SAE J2420 COE Frontal Strength Evaluation Dynamic Loading Heavy Trucks, Section 5 of SAE J2422 Cab Roof Strength Evaluation Quasi –Static Loading Heavy Trucks and ECE R29 Uniform Provisions Concerning the Approval of Vehicles with regard to the Protection of the Occupants of the Cab of a Commercial Vehicles Annex 3 Paragraph 5.

The above tests have been witnessed by and attested to by an independent third party. The test results were recorded using cameras, high speed imagers, accelerometers and strain gauges. Documentation of the testing shall be provided upon request.

ELECTRICAL SYSTEM

The chassis shall include a single starting electrical system which shall include a 12 volt direct current multiplexing system, suppressed per SAE J551. The wiring shall be appropriate gauge cross link with 311 degree Fahrenheit insulation. All SAE wires in the chassis shall be color coded and shall include the circuit number and function where possible. The wiring shall be protected by 275 degree Fahrenheit minimum high temperature flame retardant loom. All nodes and sealed Deutsch connectors shall be waterproof.

MULTIPLEX DISPLAY

The multiplex electrical system shall include (2) Weldon Vista IV displays which shall be located one (1) on the right side of the dash in the switch panel and one (1) on the left side of the dash in the switch panel. The Vista IV displays shall feature full color LCD display screens which include a message bar displaying the time of day and important messages requiring acknowledgement by the user which shall all be displayed on the top of the screen in the order they are received. There shall be eight (8) push button virtual controls, four (4) on each side of the display for the on-board diagnostics. The display screens shall be video ready for back-up cameras, thermal cameras, and DVD.

The Vista IV displays shall offer varying fonts and background colors. The displays shall be fully programmable to the needs of the customer and shall offer virtually infinite flexibility for screen configuration options.

LOAD MANAGEMENT SYSTEM

The apparatus load management shall be performed by the included multiplex system. The multiplex system shall also feature the priority of sequences and shall shed electrical loads based on the priority list specifically programmed.

DATA RECORDING SYSTEM

The chassis shall have a Weldon Vehicle Data Recorder (VDR) system installed. The system shall be designed to meet NFPA 1901 and shall be integrated with the Weldon Multiplex electrical system. The following information shall be recorded:

- Vehicle Speed
- Acceleration
- Deceleration
- Engine Speed
- Engine Throttle Position
- ABS Event
- Seat Occupied Status
- Seat Belt Status
- Master Optical Warning Device Switch Position
- Time
- Date
Each portion of the data shall be recorded at the specified intervals and stored for the specified length of time to meet NFPA 1901 guidelines and shall be retrievable by connecting a laptop computer to the VDR system.

**ACCESSORY POWER**

The electrical distribution panel shall include two (2) power studs. The studs shall be size #10 and each of the power studs shall be circuit protected with a fuse of the specified amperage. One (1) power stud shall be capable of carrying up to a 40 amp battery direct load. One (1) power stud shall be capable of carrying up to a 15 amp ignition switched load. The two (2) power studs shall share one (1) #10 ground stud.

An OEM body connections bracket shall be installed on the chassis near the left hand battery box. The bracket shall include one (1) set each of 200 amp master power switched and 300 amp battery direct fused power and ground studs.

**EXTERIOR ELECTRICAL TERMINAL COATING**

All terminals exposed to the elements will be sprayed with a high visibility protective rubberized coating to prevent corrosion.

**ENGINE**

The chassis engine shall be a Cummins L9 engine. The L9 engine shall be an in-line six (6) cylinder, four cycle diesel powered engine. The engine shall offer a rating of 450 horse power at 2100 RPM and shall be governed at 2200 RPM. The torque rating shall feature 1250 foot pounds of torque at 1200 RPM with 543 cubic inches (8.9 liters) of displacement.

The L9 engine shall feature a VGT™ Turbocharger, a high pressure common rail fuel system, fully integrated electronic controls with an electronic governor, and shall be EPA certified to meet the 2021 emissions standards using cooled exhaust gas recirculation and selective catalytic reduction technology.

The engine shall include an engine mounted combination full flow/by-pass oil filter with replaceable spin on cartridge for use with the engine lubrication system. The engine shall include Citgo brand Citgard 500, or equivalent SAE 15W40 CK-4 low ash engine oil which shall be utilized for proper engine lubrication.

A wiring harness shall be supplied ending at the back of the cab. The harness shall include a connector which shall allow an optional harness for the pump panel. The included circuits shall be provided for a tachometer, oil pressure, engine temperature, hand throttle, high idle and a PSG system. A circuit for J1939 data link shall also be provided at the back of the cab.

**CAB ENGINE TUNNEL**

The cab interior shall include an integrated engine tunnel constructed of 5052-H32 Marine Grade, 0.19 of an inch thick aluminum. The tunnel shall be a maximum of 41.50 inches wide X 25.50 inches high.

**DIESEL PARTICULATE FILTER CONTROLS**

There shall be two (2) controls for the diesel particulate filter. One (1) control shall be for regeneration and one (1) control shall be for regeneration inhibit.

**ENGINE PROGRAMMING HIGH IDLE SPEED**

The engine high idle control shall maintain the engine idle at approximately 1250 RPM when engaged.

**ENGINE HIGH IDLE CONTROL**

The vehicle shall be equipped with a virtual Vista button and an automatic high-idle speed control. It shall be pre-set so when activated, it will operate the engine at the appropriate RPM to increase alternator output. This device shall operate
only when the engine is running and the transmission is in neutral with the parking brake set. The device shall disengage when the operator depresses the brake pedal, or the transmission is placed in gear, and shall be available to manually or automatically re-engage when the brake is released, or when the transmission is placed in neutral. There shall be an indicator on the Vista display and control screen for the high idle speed control.

**ENGINE PROGRAMMING ROAD SPEED GOVERNOR**

Y__ N__

The engine shall include programming which will govern the top speed of the vehicle.

**AUXILIARY ENGINE BRAKE**

Y__ N__

A compression brake, for the six (6) cylinder engine shall be provided. A cutout relay shall be installed to disable the compression brake when in pump mode or when an ABS event occurs. The engine compression brake shall activate upon 0% accelerator when in operation mode and actuate the vehicle’s brake lights. The engine shall utilize a variable geometry turbo (VGT) as an integrated auxiliary engine brake to offer a variable rate of exhaust flow, which when activated in conjunction with the compression brake shall enhance the engine's compression braking capabilities.

**AUXILIARY ENGINE BRAKE CONTROL**

Y__ N__

An engine compression brake control device shall be included. The electronic control device shall monitor various conditions and shall activate the engine brake only if all of the following conditions are simultaneously detected:

- A valid gear ratio is detected.
- The driver has requested or enabled engine compression brake operation.
- The throttle is at a minimum engine speed position.
- The electronic controller is not presently attempting to execute an electronically controlled final drive gear shift.

The compression brake shall be controlled via an off/low/medium/high virtual button on the Vista display and control screen. The multiplex system shall remember and default to the last engine brake control setting when the vehicle is shut off and re-started.

**ELECTRONIC ENGINE OIL LEVEL INDICATOR**

Y__ N__

The engine oil shall be monitored electronically and shall send a signal to activate a warning in the instrument panel when levels fall below normal. The warning shall activate in a low oil situation upon turning on the master battery and ignition switches without the engine running.

**FLUID FILLS**

Y__ N__

The front of the chassis shall accommodate fluid fill for the engine oil through the grille. This area shall also accommodate a check for the engine oil. The transmission, power steering, and coolant fluid fills and checks shall be under the cab. The windshield washer fill shall be accessible through the front left side mid step.

**ENGINE DRAIN PLUG**

Y__ N__

The engine shall include an original equipment manufacturer installed oil drain plug.

**ENGINE WARRANTY**

Y__ N__

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

A Fire Research Pump Boss 400 governor with dual pressure sensors shall be provided for the electronic engine. It shall include a remote mountable control head.

The Pump Boss 400 shall regulate the pump pressure and monitor all essential engine parameters.

LED readouts shall display RPM, PSI, pump discharge and intake pressure, engine oil pressure, engine temperature, transmission temperature, and battery voltage. An audible alarm shall also be part of the system.

REMOTE THROTTLE HARNESS

An apparatus interface wiring harness for the engine shall be supplied with the chassis. The harness shall include a connector for connection to the chassis harness which shall terminate in the left frame rail behind the cab for reconnection by the apparatus builder. The harness shall contain connectors for a FRC Pump Boss pressure governor and a multiplexed gauge. Separate circuits shall be included for pump controls, “Pump Engaged” and “OK to Pump” indicator lights, open compartment ground, start signal, park brake ground, ignition signal, master power, customer ignition, air horn solenoid switch, high idle switch and high idle indication light. The harness shall contain interlocks that will prevent shifting to road or pump mode unless the transmission output speed translates to less than 1 mph and the transmission is in neutral. The shift to pump mode shall also require the park brake be set. The harness shall be designed for a top mount pump panel.

An apparatus interface wiring harness shall also be included which shall be wired to the cab harness interface connectors and shall incorporate circuits with relays to control pump functions. This harness shall control the inputs for the transmission lock up circuits, governor/hand throttle controls and dash display which shall incorporate “Pump Engaged” and “OK to Pump” indicator lights. The harness shall contain circuits for the apparatus builder to wire in a pump switch.

ENGINE PROGRAMMING REMOTE THROTTLE

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

ENGINE PROGRAMMING IDLE SPEED

The engine low idle speed will be programmed at 700 rpm.

ENGINE AIR INTAKE

The engine air intake system shall include an ember separator. This ember separator shall be designed to protect the downstream air filter from embers using a combination of unique flat and crimped metal screens packaged in a heavy duty galvanized steel frame. This multilayered screen shall trap embers and allow them to burn out before passing through the pack.

The engine air intake system shall also include an air cleaner mounted above the radiator. This air cleaner shall utilize a replaceable dry type filter element designed to prevent dust and debris from being ingested into the engine. A service cover shall be provided on the housing, reducing the chance of contaminating the air intake system during air filter service.

The air intake system shall include a restriction indicator light in the warning light cluster on the instrument panel, which shall activate when the air cleaner element requires replacement.

ENGINE FAN DRIVE

The engine cooling system fan shall incorporate a thermostatically controlled, Horton fully variable type fan drive with SmartClutch J-1939 CAN controller.
The variable speed fan clutch only engages at the amount needed for proper cooling to facilitate improved vehicle performance, cab heating in cold climates, and fuel economy. The fan clutch design shall be fail-safe so that if the clutch drive fails the fan shall engage to prevent engine overheating due to the fan clutch failure. The fan speed shall include a J-1939 CAN clutch controller to receive signal from the engine control module to activate at variable rates of speed. Variable speeds shall be set through thermostatic and engine speed signals to run as efficiently and quietly as required to maintain temperature.

**ENGINE COOLING SYSTEM**

There shall be a heavy-duty aluminum cooling system designed to meet the demands of the emergency response industry. The cooling system shall have the capacity to keep the engine properly cooled under all conditions of road and pumping operations. The cooling system shall be designed and tested to meet or exceed the requirements specified by the engine and transmission manufacturer and all EPA requirements. The complete cooling system shall be mounted to isolate the entire system from vibration or stress. The individual cores of the cooling system shall be mounted in a manner to allow expansion and contraction at various rates without inducing stress into the adjoining cores.

The cooling system shall be comprised of a charge air cooler to radiator serial flow package that provides the maximum cooling capacity for the specified engine as well as serviceability. The main components shall include a surge tank, a charge air cooler bolted to the front of the radiator, recirculation shields, a shroud, a fan, and required tubing.

The radiator shall be a down-flow design constructed with aluminum cores, plastic end tanks, and a steel frame. The radiator shall be equipped with a drain cock to drain the coolant for serviceability.

The cooling system shall include a one piece injected molded polymer fan with a three (3) piece fiberglass fan shroud.

The cooling system shall be equipped with a surge tank that is capable of removing entrained air from the system. The surge tank shall be equipped with a low coolant probe and rearward oriented sight glass to observe coolant in the system. A cold fill and observation line shall be included within the frame mounted translucent recovery bottle to monitor the level of the coolant. The surge tank shall have a dual seal cap that meets the engine manufacturer's pressure requirements and allows for expansion and recovery of coolant into a separate integral expansion chamber.

All radiator tubes shall be formed from aluminized steel tubing. Recirculation shields shall be installed where required to prevent heated air from reentering the cooling package and affecting performance.

The charge air cooler shall be a cross-flow design constructed completely of aluminum with cast tanks. All charge air cooler tubes shall be formed from aluminized steel tubing and installed with silicone hump hoses and stainless steel “constant torque” style clamps meeting the engine manufacturer's requirements.

The radiator and charge air cooler shall be removable through the bottom of the chassis.

**ENGINE COOLING SYSTEM PROTECTION**

The engine cooling system shall include a recirculation shield designed to act as a light duty skid plate below the radiator to provide additional protection for the engine cooling system from light impacts, stones, and road debris. The skid plate shall be painted to match the frame components.

**ENGINE COOLANT**

The cooling package shall include Extended Life Coolant (ELC). The use of ELC provides longer intervals between coolant changes over standard coolants providing improved performance. The coolant shall contain a 50/50 mix of ethylene glycol and de-ionized water to keep the coolant from freezing to a temperature of -34 degrees Fahrenheit.

Proposals offering supplemental coolant additives (SCA) shall not be considered, as this is part of the extended life coolant makeup.
**ELECTRONIC COOLANT LEVEL INDICATOR**

Y __ N __

The instrument panel shall feature a low engine coolant indicator light which shall be located in the center of the instrument panel. An audible tone alarm shall also be provided to warn of a low coolant incident.

**ENGINE PUMP HEAT EXCHANGER**

Y __ N __

A single bundle type coolant to water heat exchanger shall be installed between the engine and the radiator. The heat exchanger shall be designed to prohibit water from the pump from coming in contact with the engine coolant. This shall allow the use of water from the discharge side of the pump to assist in cooling the engine.

**COOLANT HOSES**

Y __ N __

The cooling systems hose shall be formed silicone hose and formed aluminized steel tubing and include stainless steel constant torque band clamps.

**ENGINE COOLANT OVERFLOW BOTTLE**

Y __ N __

A remote engine coolant overflow expansion bottle shall be provided in the case of over filling the coolant system. The overflow bottle shall capture the expansion fluid or overfill rather than allow the fluid to drain on the ground.

**ENGINE EXHAUST SYSTEM**

Y __ N __

The exhaust system shall include an end-in end-out horizontally mounted single module after treatment device, and downpipe from the charge air cooled turbo. The single module shall include four temperature sensors, diesel particulate filter (DPF), urea dosing module (UL2), and a selective catalytic reduction (SCR) catalyst to meet current EPA standards. The selective catalytic reduction catalyst utilizes a diesel exhaust fluid solution consisting of urea and purified water to convert NOx into nitrogen, water, and trace amounts of carbon dioxide. The solution shall be mixed and injected into the system through the DPF and SCR.

The system shall utilize 0.07 inch thick stainless steel exhaust tubing between the engine turbo and the DPF. Zero leak clamps seal all system joints between the turbo and DPF.

The single module after treatment through the end of the tailpipe shall be connected with zero leak clamps. The discharge shall terminate horizontally on the right side of the vehicle ahead of the rear tires.

The exhaust system after treatment module shall be mounted below the frame in the outboard position.

**DIESEL EXHAUST FLUID TANK**

Y __ N __

The exhaust system shall include a molded cross linked polyethylene tank for Diesel Exhaust Fluid (DEF). The tank shall have a capacity of six (6) usable gallons and shall be mounted on the left hand side of the chassis frame behind the batteries below the frame.

The DEF tank shall be designed with capacity for expansion in case of fluid freezing. Engine coolant, which shall be thermostatically controlled, shall be run through lines in the tank to help prevent the DEF from freezing and to provide a means of thawing the fluid if it should become frozen.

The tank fill tube shall be routed under the rear of the cab with the fill neck and splash guard accessible in the top rear step.
ENGINE EXHAUST ACCESSORIES

An exhaust temperature mitigation device shall be shipped loose for installation by the body manufacturer on the vehicle. The temperature mitigation device shall lower the temperature of the exhaust by combining ambient air with the exhaust gasses at the exhaust outlet.

The tail pipe shall have a drop in it to allow additional clearance from the body.

ENGINE EXHAUST WRAP

The exhaust tubing between the engine turbo and the diesel particulate filter (DPF) shall be wrapped with a thermal cover in order to retain the necessary heat for DPF regeneration. The exhaust wrap shall also help protect surrounding components from radiant heat which can be transferred from the exhaust.

The exhaust flex joint shall not include the thermal exhaust wrap.

TRANSMISSION

The drive train shall include an Allison model EVS 3000 torque converting, automatic transmission which shall include electronic controls. The transmission shall feature two (2) 10-bolt PTO pads located on the converter housing.

The transmission shall include two (2) internal oil filters and Castrol TranSynd™ synthetic TES 295 transmission fluid which shall be utilized in the lubrication of the EVS transmission. An electronic oil level sensor shall be included with the readout located in the shift selector.

The transmission gear ratios shall be:

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<thead>
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TRANSMISSION MODE PROGRAMMING

The transmission, upon start-up, will automatically select a four (4) speed operation. The fifth speed over drive shall be available with the activation of the mode button on the shifting pad.

TRANSMISSION FEATURE PROGRAMMING

The Allison Gen V-E transmission EVS group package number 127 shall contain the 198 vocational package in consideration of the duty of this apparatus as a pumper. This package shall incorporate an automatic neutral with selector override. This feature commands the transmission to neutral when the park brake is applied, regardless of drive range requested on the shift selector. This requires re-selecting drive range to shift out of neutral for the override.

This package shall be coupled with the use of a split shaft PTO and incorporate pumping circuits. These circuits shall be used allowing the vehicle to operate in the fourth range lockup while operating the pump mode due to the 1 to 1 ratio through the transmission, therefore the output speed of the engine is the input speed to the pump. The pump output can be easily calculated by using this input speed and the drive ratio of the pump itself to rate the gallons of water the pump can provide.

A transmission interface connector shall be provided in the cab. This package shall contain the following input/output circuits to the transmission control module. The Gen V-E transmission shall include prognostic diagnostic capabilities. These capabilities shall include the monitoring of the fluid life, filter change indication, and transmission clutch maintenance.
### ELECTRONIC TRANSMISSION OIL LEVEL INDICATOR

The transmission fluid shall be monitored electronically and shall send a signal to activate a warning in the instrument panel when levels fall below normal.

### TRANSMISSION SHIFT SELECTOR

An Allison pressure sensitive range selector touch pad shall be provided and located to the right of the driver within clear view and easy reach. The shift selector shall have a graphical Vacuum Florescent Display (VFD) capable of displaying two lines of text. The shift selector shall provide mode indication and a prognostic indicator (wrench symbol) on the digital display. The prognostics monitor various operating parameters and shall alert you when a specific maintenance function is required.

### TRANSMISSION PRE-SELECT WITH AUXILIARY BRAKE

When the auxiliary brake is engaged, the transmission shall automatically shift to second gear to decrease the rate of speed assisting the secondary braking system and slowing the vehicle.

### TRANSMISSION COOLING SYSTEM

The transmission shall include a water to oil cooler system located in the cooling loop between the radiator and the engine. The transmission cooling system shall meet all transmission manufacturer requirements. The transmission cooling system shall feature continuous flow of engine bypass water to maintain uninterrupted transmission cooling.

### TRANSMISSION DRAIN PLUG

The transmission shall include an original equipment manufacturer installed magnetic transmission fluid drain plug.

### TRANSMISSION WARRANTY

The Allison EVS series transmission shall be warranted for a period of five (5) years with unlimited mileage. Parts and labor shall be included in the warranty.

### PTO LOCATION

The transmission shall have two (2) power take off (PTO) mounting locations, one (1) in the 8:00 o’clock position and one (1) in the 4:00 o’clock position.

### DRIVELINE

All drivelines shall be heavy duty metal tube and equipped with MSI 1710 series universal joints. The shafts shall be dynamically balanced prior to installation to alleviate future vibration. In areas of the driveline where a slip shaft is required, the splined slip joint shall be coated with Glide Coat®. The drivelines shall include Meritor brand u-joints with thrust washers.
**MIDSHIP PUMP / GEARBOX**

A temporary jackshaft driveline shall be installed by the chassis manufacturer to accommodate the mid-ship split shaft pump as specified by the apparatus manufacturer.

**MIDSHIP PUMP / GEARBOX MODEL**

The midship pump/gearbox provisions shall be for a Waterous CSUC20 pump.

**MIDSHIP PUMP GEARBOX DROP**

The Waterous pump gearbox shall have a “C” (medium length) drop length.

**MIDSHIP PUMP RATIO**

The ratio for the midship pump shall be 2.27:1.

**MIDSHIP PUMP LOCATION C/L SUCTION TO C/L REAR AXLE**

The midship pump shall be located so the dimension from the centerline of the suction to the centerline of the rear axle is 110.00 inches.

**PUMP SHIFT CONTROLS**

One (1) air pump shift control panel shall be located on the left hand side of the engine tunnel, integrated with the shifter pod. The following shall be provided on the panel: a three (3) position control lever; an engraved PUMP ENGAGED identification light; and an engraved OK TO PUMP identification light. The pump shift control panel shall be black with a yellow border outline and shall include pump instructions. An instruction plate describing the transmission shift selector position used for pumping shall be provided and located so it can be read from the driver’s position per NFPA 16.10.1.3. The road mode shall be selected when the control lever is in the forward position and pump mode shall be selected when the control lever is in the rearward position.

The control lever center position shall exhaust air from both pump and road sides of the pump gear box shift cylinder.

**PUMP SHIFT CONTROL PLUMBING**

Air connections shall be provided from the air supply tank to the pump shift control valve and from the pump shift control valve to the frame mounted bracket. The frame mounted bracket shall include labeling identifying the pump and road connection points with threaded 0.25 inch NPT fittings on the solenoid for attaching the customer installed pump. The air supply shall be pressure protected from service brake system.

**FUEL FILTER/WATER SEPARATOR**

The fuel system shall have a Fleetguard FS20121 fuel filter/water separator as a primary filter. The fuel filter shall have a drain valve.

A water in fuel sensor shall be provided and wired to an instrument panel lamp and audible alarm to indicate when water is present in the fuel/water separator.

A secondary fuel filter shall be included as approved by the engine manufacturer.
FUEL LINES

The fuel system supply and return lines installed from the fuel tank to the engine shall be reinforced nylon tubing rated for diesel fuel. The fuel lines shall be brown in color and connected with brass fittings.

FUEL SHUTOFF VALVE

A fuel shutoff valve shall be installed in the fuel draw line at the primary fuel filter to allow the fuel filter to be changed without loss of fuel to the fuel pump.

ELECTRIC FUEL PRIMER

Integral to the engine assembly is an electric lift pump that serves the purpose of pre-filter fuel priming.

FUEL TANK

The fuel tank shall have a capacity of sixty-eight (68) gallons and shall measure 35.00 inches in width X 17.00 inches in height X 29.00 inches in length.

The baffled tank shall have a vent port to facilitate venting to the top of the fill neck for rapid filling without "blow-back" and a roll over ball check vent for temperature related fuel expansion and draw.

The tank is designed with dual draw tubes and sender flanges. The tank shall have 2.00 inch NPT fill ports for right or left hand fill. A 0.50 inch NPT drain plug shall be centered in the bottom of the tank.

The fuel tank shall be mounted below the frame, behind the rear axle. Two (2) three-piece strap hanger assemblies with "U" straps bolted midway on the fuel tank front and rear shall be utilized to allow the tank to be easily lowered and removed for service purposes. Rubber isolating pads shall be provided between the tank and the upper tank mounting brackets. Strap mounting studs through the rail, hidden behind the body shall not be acceptable.

FUEL TANK MATERIAL AND FINISH

The fuel tank shall be constructed of 12 gauge aluminized steel. The exterior of the tank shall be powder coated black and then painted to match the frame components.

All powder coatings, primers and paint shall be compatible with all metals, pretreatments and primers used. The cross hatch adhesion test per ASTM D3359 Method B, results to be 5B minimum. The pencil hardness test per ASTM D3363 shall have a final post-curved pencil hardness of H-2H. The direct impact resistance test per ASTM D2794, results to be 5B minimum.

Any proposals offering painted fuel tanks with variations from the above process shall not be accepted. The film thickness of vendor supplied parts shall also be sufficient to meet the performance standards as stated above.

FUEL TANK STRAP MATERIAL

The fuel tank straps shall be constructed of ASTM A-36 steel. The fuel tank straps shall be powder coated black and then painted to match the frame components if possible.

FUEL TANK FILL PORT

The fuel tank fill ports shall be provided with two (2) left fill ports located one (1) in the forward position and one (1) in the middle position and the right fill port located in the middle position of the fuel tank.
**FUEL TANK DRAIN PLUG**

A 0.5 inch NPT magnetic drain plug shall be centered in the bottom of the fuel tank.

**FRONT AXLE**

The front axle shall be a Meritor Easy Steer Non drive front axle, model number MFS-20. The axle shall include a 3.74 inch drop and a 71.00 inch king pin intersection (KPI). The axle shall include a conventional style hub with a standard knuckle.

**FRONT AXLE WARRANTY**

The front axle shall be warranted by Meritor for five (5) years with unlimited miles under the general service application. Details of the Meritor warranty are provided on the PDF document attached to this option.

**FRONT WHEEL BEARING LUBRICATION**

The front axle wheel bearings shall be lubricated with oil. The oil level can be visually checked via clear inspection windows in the front axle hubs.

**FRONT SHOCK ABSORBERS**

Two (2) Bilstein inert, nitrogen gas filled shock absorbers shall be provided and installed as part of the front suspension system. The shocks shall be a monotubular design and fabricated using a special extrusion method, utilizing a single blank of steel without a welded seam, achieving an extremely tight peak-to-valley tolerance and maintains consistent wall thickness. The monotubular design shall provide superior strength while maximizing heat dissipation and shock life.

The ride afforded through the use of a gas shock is more consistent and shall not deteriorate with heat, the same way a conventional oil filled hydraulic shock would.

The Bilstein front shocks shall include a digressive working piston assembly allowing independent tuning of the compression and rebound damping forces to provide optimum ride and comfort without compromise. The working piston design shall feature fewer parts than most conventional twin tube and “road sensing” shock designs and shall contribute to the durability and long life of the Bilstein shock absorbers.

Proposals offering the use of conventional twin tube or “road sensing” designed shocks shall not be considered.

**FRONT SUSPENSION**

The front suspension shall include a ten (10) leaf spring pack in which the longest leaf measures 54.00 inch long and 4.00 inches wide and shall include a military double wrapped front eye. Both spring eyes shall have a case hardened threaded bushing installed with lubrication counter bore and lubrication land off cross bore with grease fitting. The spring capacity shall be rated at 21,500 pounds.

**STEERING COLUMN/ WHEEL**

The cab shall include a Douglas Autotech steering column which shall include a seven (7) position tilt, a 2.25 inch telescopic adjustment, and an 18.00 inch, four (4) spoke steering wheel located at the driver’s position. The steering wheel shall be covered with black polyurethane foam padding.

The steering column shall contain a horn button, self-canceling turn signal switch, four-way hazard switch and headlamp dimmer switch.
ELECTRONIC POWER STEERING FLUID LEVEL INDICATOR

The power steering fluid shall be monitored electronically and shall send a signal to activate an audible alarm and visual warning in the instrument panel when fluid level falls below normal.

POWER STEERING PUMP

The hydraulic power steering pump shall be a TRW PS and shall be gear driven from the engine. The pump shall be a balanced, positive displacement, sliding vane type. The power steering system shall include an oil to air passive cooler.

FRONT AXLE CRAMP ANGLE

The chassis shall have a front axle cramp angle of 48-degrees to the left and 44-degrees to the right.

POWER STEERING GEAR

The power steering gear shall be a TRW model TAS 65 with an assist cylinder.

CHASSIS ALIGNMENT

The chassis frame rails shall be measured to insure the length is correct and cross checked to make sure they run parallel and are square to each other. The front and rear axles shall be laser aligned. The front tires and wheels shall be aligned and toe-in set on the front tires by the chassis manufacturer.

REAR AXLE

The rear axle shall be a Meritor model RS-25-160 single drive axle. The axle shall include precision forged, single reduction differential gearing, and shall have a fire service rated capacity of 27,000 pounds.

The axle shall be built of superior construction and quality components to provide the rugged dependability needed to stand up to the fire industry’s demands. The axle shall include rectangular shaped, hot-formed housing with a standard wall thickness of 0.63 of an inch for extra strength and rigidity and a rigid differential case for high axle strength and reduced maintenance.

The axle shall have heavy-duty Hypoid gearing for longer life, greater strength and quieter operation. Industry-standard wheel ends for compatibility with both disc and drum brakes, and unitized oil seal technology to keep lubricant in and help prevent contaminant damage will be used.

REAR AXLE DIFFERENTIAL LUBRICATION

The rear axle differential shall be lubricated with oil.

REAR AXLE WARRANTY

The rear axle shall be warranted by Meritor for five (5) years with unlimited miles under the general service application. Details of the Meritor warranty are provided on the PDF document attached to this option.
REAR WHEEL BEARING LUBRICATION

The rear axle wheel bearings shall be lubricated with oil.

Y__ N__

VEHICLE TOP SPEED

The top speed of the vehicle shall be approximately 68 MPH +/-2 MPH at governed engine RPM.

Y__ N__

REAR SUSPENSION

The single rear axle shall feature a Reyco 79KB vari-rate, self-leveling captive slipper type conventional multi-leaf spring suspension, with 57.50 inch X 3.00 inch springs. One (1) adjustable and one (1) fixed torque rod shall be provided.

The rear suspension capacity shall be rated from 21,000 to 31,500 pounds.

Y__ N__

TIRED INTERMITTENT SERVICE RATING

The chassis shall be rated using Intermittent Service ratings provided to the emergency vehicle market by the tire manufacturers as the basis for determining the maximum vehicle load and speed.

Y__ N__

FRONT TIRE

The front tires shall be Goodyear 315/80R-22.5 20PR "L" tubeless radial G289 WHA highway tread.

The front tire stamped load capacity shall be 20,400 pounds per axle with a nominal speed rating of 68 miles per hour when properly inflated to 130 pounds per square inch.

The Goodyear Intermittent Service Rating maximum load capacity shall match the stamped rating.

The Goodyear Intermittent Service Rating maximum speed capacity shall match the nominal speed rating.

The Goodyear Intermittent Service Rating limits the operation of the emergency vehicle to no more than fifty (50) miles of continuous operation under maximum recommended payload, or without stopping for at least twenty (20) minutes. The emergency vehicle must reduce its speed to no more than 50 MPH after the first fifty (50) miles of travel.

Y__ N__

REAR TIRE

The rear tires shall be Goodyear 12R-22.5 16PR "H" tubeless radial G622 RSD mixed service tread.

The rear tire stamped load capacity shall be 27,120 pounds per axle with a nominal speed rating of 75 miles per hour when properly inflated to 120 pounds per square inch.

The Goodyear Intermittent Service Rating maximum load capacity shall be 29,020 pounds per axle with a speed rating of 75 miles per hour when properly inflated to 120 pounds per square inch.

The Goodyear Intermittent Service Rating maximum speed capacity shall match the nominal speed rating.

The Goodyear Intermittent Service Rating limits the operation of the emergency vehicle to no more than fifty (50) miles of continuous operation under maximum recommended payload, or without stopping for at least twenty (20) minutes. The emergency vehicle must reduce its speed to no more than 50 MPH after the first fifty (50) miles of travel.
REAR AXLE RATIO

The rear axle ratio shall be 5.13:1.

Y__ N__

TIRE PRESSURE INDICATOR

There shall be electronic chrome LED valve caps shipped loose for installation by the OEM which shall illuminate with a red LED when tire pressure drops 8psi provided. The valve caps are self-calibrating and set to the pressure of the tire upon installation.

Y__ N__

FRONT WHEEL

The front wheels shall be Alcoa hub piloted, 22.50 inch X 9.00 inch polished LvL One™ aluminum wheels. The hub piloted mounting system shall provide easy installation and shall include two-piece flange nuts. The wheels shall feature one-piece forged strength and a polished finish that lasts.

Y__ N__

REAR WHEEL

The outer rear wheels shall be Alcoa hub piloted, 22.50 inch X 8.25 inch LvL One™ aluminum wheels with a polished outer surface. The inner rear wheels shall be Alcoa hub piloted, 22.50 inch X 8.25 inch aluminum wheels with LvL One™ bright machine finish. The hub piloted mounting system shall provide easy installation and shall include two-piece flange nuts.

Y__ N__

WHEEL TRIM

The front wheels shall include stainless steel lug nut covers and stainless steel baby moons. The baby moons shall have cutouts for oil seal viewing when applicable.

The rear wheels shall include stainless steel lug nut covers and band mounted spring clip stainless steel high hats.

The lug nut covers, baby moons, and high hats shall be RealWheels® brand constructed of 304L grade, non-corrosive stainless steel with a mirror finish. Each wheel trim component shall meet D.O.T. certification.

Y__ N__

TIRE CHAINS

Onspot brand six (6) strand automatic ice chains shall be installed on the rear axle of the chassis to provide instant traction while traveling on ice and snow at speeds below 35 MPH.

Y__ N__

TIRE CHAINS ACTIVATION

The tire chain system shall be activated by a virtual button on the Vista display and control screen. The virtual button shall display “Active” when the tire chains are engaged. The tire chains shall be interlocked with the transmission and shall engage only if the vehicle is traveling 30 MPH or less. After traveling over 30 MPH, the vehicle must be reduced to a speed below 5 MPH for the tire chains to be engaged or re-engaged. The virtual button, once the vehicle reaches 35 MPH shall be reset to “Inactive”. The vehicle must then reduce to a speed below 5 MPH to enable the tire chains virtual button.

Y__ N__

BRAKE SYSTEM

A rapid build-up air brake system shall be provided. The air brakes shall include, at a minimum, a two (2) air tank, three (3) reservoir system with a total of 4152 cubic inch of air capacity. A floor mounted treadle valve shall be mounted inside the cab for graduated control of applying and releasing the brakes. An inversion valve shall be installed to provide a
service brake application in the unlikely event of primary air supply loss. All air reservoirs provided on the chassis shall be labeled for identification.

The rear axle spring brakes shall automatically apply in any situation when the air pressure falls below 25 PSI and shall include a mechanical means for releasing the spring brakes when necessary. An audible alarm shall designate when the system air pressure is below 60 PSI.

A four (4) sensor, four (4) modulator Anti-lock Braking System (ABS) shall be installed on the front and rear axles in order to prevent the brakes from locking or skidding while braking during hard stops or on icy or wet surfaces. This in turn shall allow the driver to maintain steering control under heavy braking and in most instances, shorten the braking distance. The electronic monitoring system shall incorporate diagonal circuitry which shall monitor wheel speed during braking through a sensor and tone ring on each wheel. A dash mounted ABS lamp shall be provided to notify the driver of a system malfunction. The ABS system shall automatically disengage the auxiliary braking system device when required. The speedometer screen shall be capable of reporting all active defaults using PID/SID and FMI standards.

Additional safety shall be accommodated through Automatic Traction Control (ATC) which shall be installed on the single rear axle. The ATC system shall apply the ABS when the drive wheels loose traction. The system shall scale the electronic engine throttle back to prevent wheel spin while accelerating on ice or wet surfaces.

A virtual style switch shall be provided and properly labeled “mud/snow”. When the switch is pressed once, the system shall allow a momentary wheel slip to obtain traction under extreme mud and snow conditions. During this condition the ATC light shall blink continuously notifying the driver of activation. Pressing the switch again shall deactivate the mud/snow feature.

The Electronic Stability Control (ESC) unit is a functional extension of the electronic braking system. It is able to detect any skidding of the vehicle about its vertical axis as well as any rollover tendency. The control unit comprises an angular-speed sensor that measures the vehicle's motion about the vertical axis, caused, for instance, by cornering or by skidding on a slippery road surface. An acceleration sensor measures the vehicle’s lateral acceleration. The Controller Area Network (CAN) bus provides information on the steering angle. On the basis of lateral acceleration and steering angle, an integrated microcontroller calculates a theoretical angular speed for the stable vehicle condition.

FRONT BRAKES

The front brakes shall be Meritor EX225 Disc Plus disc brakes with 17.00 inch vented rotors.

REAR BRAKES

The rear brakes shall be Meritor 16.50 inch X 7.00 inch S-cam drum type. The brakes shall feature a cast iron shoe.

PARK BRAKE

Upon application of the push-pull valve in the cab, the rear brakes will engage via mechanical spring force. This is accomplished by dual chamber rear brakes, satisfying the FMVSS parking brake requirements.

PARK BRAKE CONTROL

A Meritor-Wabco manual hand control push-pull style valve shall operate the parking brake.

The parking brake actuation valve shall be mounted to the left side of the engine tunnel integrated into the transmission shift pod console within easy access of the driver.

REAR BRAKE SLACK ADJUSTERS

The rear brakes shall include Meritor automatic slack adjusters installed on the axle which features a simple, durable design offering reduced weight. The automatic slack adjusters shall feature a manual adjusting nut which cannot inadvertently be backed off and threaded grease fittings for easy serviceability.
AIR DRYER

The brake system shall include a Wabco System Saver 1200 air dryer with an integral 100 watt heater with a Metri-Pack sealed connector. The air dryer incorporates an internal turbo cutoff valve that closes the path between the air compressor and air dryer purge valve during the compressor “unload” cycle. The turbo cutoff valve allows purging of moisture and contaminants without the loss of turbo boost pressure. The air dryer shall be located on the right hand frame rail forward of the front wheel behind the right hand cab step.

FRONT BRAKE CHAMBERS

The front brakes shall be provided with MGM type 24 long stroke brake chambers.

REAR BRAKE CHAMBERS

The rear axle shall include TSE 30/36 brake chambers which shall convert the energy of compressed air into mechanical force and motion. This shall actuate the brake camshaft, which in turn shall operate the foundational brake mechanism forcing the brake shoes against the brake drum. The TSE Type 36 brake chamber has a 36.00 square inch effective area.

AIR COMPRESSOR

The air compressor provided for the engine shall be a Wabco® SS318 single cylinder pass-through drive type compressor which shall be capable of producing 18.7 CFM at 1200 engine RPMs. The air compressor shall feature a higher delivery efficiency translating to more air delivery per horsepower absorbed. The compressor shall include an aluminum cylinder head which shall improve cooling, reduce weight and decrease carbon formation. Superior piston and bore finishing technology shall reduce oil consumption and significantly increasing the system component life.

AIR GOVERNOR

An air governor shall be provided to control the cut-in and cut-out pressures of the engine mounted air compressor. The governor shall be calibrated to meet FMVSS requirements. The air governor shall be located on the air dryer bracket.

MOISTURE EJECTORS

Automatic moisture ejectors with a manual drain provision shall be installed on all reservoirs of the air supply system.

AIR SUPPLY LINES

The air system on the chassis shall be plumbed with color coded reinforced nylon tubing air lines. The primary (rear) brake line shall be green, the secondary (front) brake line red, the parking brake line orange and the auxiliary (outlet) will be blue.

Push to connect type fittings shall be used on the nylon tubing. All drop hoses shall include fiber reinforced neoprene covered hoses.

REAR AIR TANK MOUNTING

If a combination of wheel base, air tank quantity, or other requirements necessitate the location of one or more air tanks to be mounted rear of the fuel tank, these tank(s) will be mounted perpendicular to frame.

WHEELBASE

The chassis wheelbase shall be 222.00 inches.
REAR OVERHANG

Y__ N__

The chassis rear overhang shall be 47.00 inches.

FRAME

Y__ N__

The frame shall consist of double rails running parallel to each other with cross members forming a ladder style frame. The frame rails shall be formed in the shape of a "C" channel, with the outer rail measuring 10.25 inches high X 3.50 inches deep upper and lower flanges X 0.38 inches thick with an inner channel of 9.44 inches high X 3.13 inches deep and 0.38 inches thick. Each rail shall be constructed of 110,000 psi minimum yield high strength low alloy steel. Each double rail section shall be rated by a Resistance Bending Moment (RBM) minimum of 3,213,100 inch pounds and have a minimum section modulus of 29.21 cubic inches. The frame shall measure 35.00 inches in width.

Proposals calculating the frame strength using the "box method" shall not be considered.

Proposals including heat treated rails shall not be considered. Heat treating frame rails produces rails that are not uniform in their mechanical properties throughout the length of the rail. Rails made of high strength, low alloy steel are already at the required yield strength prior to forming the rail.

A minimum of seven (7) fully gusseted 0.25 inch thick cross members shall be installed. The inclusion of the body mounting, or bumper mounting shall not be considered as a cross member. The cross members shall be attached using zinc coated grade 8 fasteners. The bolt heads shall be flanged type, held in place by distorted thread flanged lock nuts. Each cross member shall be mounted to the frame rails utilizing a minimum of 0.25 inch thick gusset reinforcement plates at all corners balancing the area of force throughout the entire frame.

Any proposals not including additional reinforcement for each cross member shall not be considered.

All relief areas shall be cut in with a minimum 2.00 inch radius at intersection points with the edges ground to a smooth finish to prevent a stress concentration point.

FRAME WARRANTY

Y__ N__

Summary of Warranty Terms:

THE FOLLOWING IS SUMMARY OF WARRANTY TERMS FOR INFORMATION ONLY. THE ACTUAL LIMITED WARRANTY TERMS CAN BE FOUND IN THE CHASSIS WARRANTY DOCUMENT, WHICH CONTAINS THE COMPLETE STATEMENT OF THE WARRANTY. SPARTAN'S RESPONSIBILITY IS TO BE ACCORDING TO THE TERMS OF THE COMPLETE LIMITED WARRANTY DOCUMENT.

The frame and cross members shall carry a limited lifetime warranty to the original purchaser. The warranty period shall commence on the date the vehicle is delivered to the first end user.

REAR TOW DEVICE

Y__ N__

The frame rails shall contain (3) holes per frame in a pattern specified by the OEM for mounting Spartan ERV tow eyes at the rear of the frame at a location defined by the OEM.

FRAME PAINT

Y__ N__

The frame rails shall be hot dip galvanized prior to assembly and attachment of any components. The components that shall be galvanized shall include:

- Main frame “C” channel or channels

The frame parts which are not galvanized shall be powder coated prior to any attachment of components. Parts which shall be powder coated shall include but are not limited to:
• Steering gear bracket
• Front splayed rails and fish plates
• Bumper extensions
• Cross members
• Cross member gussets
• Fuel tank mounting brackets
• Fuel tank straps (unless material/finish is specified in 3130 subcat)
• Air tanks (unless color coded tanks are specified in 3205 subcat)
• Air tank mounting brackets
• Exhaust mounting brackets
• Air cleaner skid plate
• Radiator skid plate
• Battery supports, battery trays and battery covers

Other non-galvanized under carriage components which are received from the suppliers with coatings already applied shall include but are not limited to:

• Suspension components
• Front and rear axles

All powder coatings, primers and paint used on the non-galvanized components shall be compatible with all metals, pretreatments and primers used. The cross hatch adhesion test per ASTM D3359 shall not have a fail of more than ten (10) squares. The pencil hardness test per ASTM D3363 shall have a final post-curved pencil hardness of H-2H. The direct impact resistance test per ASTM D2794 shall have an impact resistance of 120.00 inches per pound at 2 mils.

**REAR MUD FLAP**

The unit shall be equipped with a temporary wooden fender and mud flap assembly for transport to the body manufacturer.

**FRONT BUMPER**

A one piece, two (2) rib wrap-around style, polished stainless steel front bumper shall be provided. The material shall be 10 gauge 304 stainless steel, 12.00 inches high and 99.00 inches wide.

**FRONT BUMPER EXTENSION LENGTH**

The front bumper shall be extended approximately 21.00 inches ahead of the cab.

**FRONT BUMPER APRON**

The 21.00 inch extended front bumper shall include an apron constructed of 0.19 inch thick embossed aluminum tread plate.

The apron shall be installed between the bumper and the front face of the cab affixed using stainless steel bolts attaching the apron to the top bumper flange.

**FRONT BUMPER COMPARTMENT CENTER**

The front bumper shall include a compartment in the bumper apron located in the center between the frame rails which may be used as a hose well. The compartment shall be constructed of 0.13 inch 5052-H32 grade aluminum and shall include drain holes in the bottom corners to allow excess moisture to escape. The compartment shall include a notched cover constructed of 0.19 inch thick bright embossed aluminum tread plate. The notch shall be located in the left front portion of the cover and shall be 4.00 inches in length with a 2.00 inches wide radius.
FRONT BUMPER COMPARTMENT COVER HARDWARE

The front bumper compartment cover(s) shall include gas cylinder stays which shall hold the cover open. Each cover shall be held in the closed position via a D-ring style latch.

MECHANICAL SIREN

The front bumper shall include an electro mechanical Federal Q2B™ siren, which shall be streamlined, chrome-plated and shall produce 123 decibels of sound at 10.00 feet. The Q2B™ siren produces a distinctive warning sound that is recognizable at long distances. A unique clutch design provides a longer coast down sound while reducing the amp draw to 100 amps. The siren shall measure 10.50 inches wide X 10.00 inches high X 14.00 inches deep. The siren shall include mounting hardware designed to recess or flush mount.

MECHANICAL SIREN LOCATION

The siren shall be recess mounted on the left side of the front fascia of the bumper approximately in the center of the flat surface between the bumper radius and the frame rail.

MECHANICAL SIREN ACCESSORIES

The front of the siren shall include (2) stainless steel flat bars approximately 1.00 inch wide by 19.00 inches long. Each bar shall be placed vertically on the right and left side of the siren face wrapping around towards the back of the siren into the bumper extension offering protection to the Q2B siren.

AIR HORN

The front bumper shall include two (2) Hadley brand E-Tone air horns which shall measure 21.00 inches long with a 6.00 inch round flare. The air horns shall be trumpet style with a chrome finish on the exterior and a painted finish deep inside the trumpet.

AIR HORN LOCATION

The air horns shall be recess mounted in the front bumper fascia between the frame rails in the right and left outboard positions.

AIR HORN RESERVOIR

One (1) air reservoir, with a 1200 cubic inch capacity, shall be installed on the chassis to act as a supply tank for operating air horns. The reservoir shall be isolated with a 90 PSI pressure protection valve on the reservoir supply side to prevent depletion of the air to the air brake system.

ELECTRONIC SIREN SPEAKER

There shall be one (1) Cast Products Inc. model SA4301, 100 watt speaker provided. The speaker shall measure 6.20 inches tall X 7.36 inches wide X 3.06 inches deep. The speaker shall include a flat mounting flange which shall be polished aluminum.
**ELECTRONIC SIREN SPEAKER LOCATION**

Y__ N__

The electronic siren speaker shall be located on the front bumper face on the right side outboard of the frame rail in the inboard position.

**FRONT BUMPER TOW HOOKS**

Y__ N__

Two (2) heavy duty tow hooks, painted to match the frame components, shall be installed in the rearward position out of the approach angle area, bolted directly to the side of each chassis frame rail with grade 8 bolts.

**CAB TILT SYSTEM**

Y__ N__

The entire cab shall be capable of tilting approximately 45-degrees to allow for easy maintenance of the engine and transmission. The cab tilt pump assembly shall be located on the right side of the chassis above the battery box.

The electric-over-hydraulic lift system shall include an ignition interlock and red cab lock down indicator lamp on the tilt control which shall illuminate when holding the “Down” button to indicate safe road operation.

It shall be necessary to activate the master battery switch and set the parking brake in order to tilt the cab. As a third precaution the ignition switch must be turned off to complete the cab tilt interlock safety circuit.

Two (2) spring-loaded hydraulic hold down hooks located outboard of the frame shall be installed to hold the cab securely to the frame. Once the hold-down hooks are set in place, it shall take the application of pressure from the hydraulic cab tilt lift pump to release the hooks.

Two (2) cab tilt cylinders shall be provided with velocity fuses in each cylinder port. The cab tilt pivots shall be 1.90 inch ball and be anchored to frame brackets with 1.25 inch diameter studs.

A steel safety channel assembly, painted safety yellow shall be installed on the right side cab lift cylinder to prevent accidental cab lowering. The safety channel assembly shall fall over the lift cylinder when the cab is in the fully tilted position. A cable release system shall also be provided to retract the safety channel assembly from the lift cylinder to allow the lowering of the cab.

**CAB TILT CONTROL RECEPTACLE**

Y__ N__

The cab tilt control cable shall include a receptacle which shall be temporarily located on the right hand chassis rail rear of the cab to provide a place to plug in the cab tilt remote control pendant. The tilt pump shall include 8.00 feet of cable with a six (6) pin Deutsch receptor with a cap.

The remote control pendant shall include 20.00 feet of cable with a mating Deutsch connector. The remote control pendant shall be shipped loose with the chassis.

**CAB TILT LOCK DOWN INDICATOR**

Y__ N__

The cab dash shall include a message located within the dual air pressure gauge which shall alert the driver when the cab is unlocked and ajar. The alert message shall cease to be displayed when the cab is in the fully lowered position and the hold down hooks are secured and locked to the cab mounts.

In addition to the alert message an audible alarm shall sound when the cab is unlocked and ajar with the parking brake released.

**CAB WINDSHIELD**

Y__ N__

The cab windshield shall have a surface area of 2825.00 square inches and be of a two (2) piece wraparound design for maximum visibility.
The glass utilized for the windshield shall include standard automotive tint. The left and right windshield shall be fully interchangeable thereby minimizing stocking and replacement costs.

Each windshield shall be installed using black self locking window rubber.

**GLASS FRONT DOOR**

The front cab doors shall include a window which is 27.00 inches in width X 26.00 inches in height. These windows shall have the capability to roll down completely into the door housing. This shall be accomplished manually utilizing a crank style handle on the inside of the door. A reinforced window regulator assembly shall be provided for severe duty use.

There shall be an irregular shaped fixed window which shall measure 2.50 inches wide at the top, 8.00 inches wide at the bottom X 26.00 inches in height, more commonly known as “cozy glass” ahead of the front door roll down windows.

The windows shall be mounted within the frame of the front doors trimmed with a black anodized ring on the exterior.

**GLASS TINT FRONT DOOR**

The windows located in the left and right front doors shall have a standard green automotive tint which shall allow seventy-five percent (75%) light transmittance.

**GLASS REAR DOOR RH**

The rear right hand side door shall include a window which is 27.00 inches in width X 26.00 inches in height. This window shall roll up and down manually utilizing a crank style handle on the inside of the door. A reinforced window regulator assembly shall be provided for severe duty use.

**GLASS TINT REAR DOOR RIGHT HAND**

The window located in the right hand side rear door shall include a standard green automotive tint which shall allow seventy-five percent (75%) light transmittance.

**GLASS REAR DOOR LH**

The rear left hand side door shall include a window which is 27.00 inches in width X 26.00 inches in height. This window shall roll up and down manually utilizing a crank style handle on the inside of the door. A reinforced window regulator assembly shall be provided for severe duty use.

**GLASS TINT REAR DOOR LEFT HAND**

The window located in the left hand side rear door shall include a standard green automotive tint which shall allow seventy-five percent (75%) light transmittance.

**GLASS SIDE MID RH**

The cab shall include a window on the right side behind the front and ahead of the crew door which shall measure 16.00 inches wide X 26.00 inches high. This window shall be fixed within this space and shall be rectangular in shape. The window shall be mounted using self locking window rubber. The glass utilized for this window shall include a green automotive tint unless otherwise noted.

**GLASS TINT SIDE MID RIGHT HAND**

The window located on the right hand side of the cab between the front and rear doors shall include a standard green automotive tint which shall allow seventy-five percent (75%) light transmittance.
GLASS SIDE MID LH

The cab shall include a window on the left side behind the front door and ahead of the crew door and above the wheel well which shall measure 16.00 inches wide X 26.00 inches high. This window shall be fixed within this space and shall be rectangular in shape. The window shall be mounted using self locking window rubber. The glass utilized for this window shall include a green automotive tint unless otherwise noted.

GLASS TINT SIDE MID LEFT HAND

The window located on the left hand side of the cab between the front and rear doors shall include a standard green automotive tint which shall allow seventy-five percent (75%) light transmittance.

GLASS REAR WALL OUTER UPPER

The rear wall of the cab on the left and right sides shall include a window which shall measure 8.00 inches in width X 26.00 inches in height. These windows shall be fixed within this space and shall be rectangular in shape. The windows shall be mounted using black self locking window rubber.

GLASS TINT REAR WALL OUTER UPPER

The windows located in the rear wall of the cab on the left and right outer upper corners shall include a standard green automotive tint which shall allow seventy-five percent (75%) light transmittance.

CLIMATE CONTROL

A ceiling mounted combination defroster and cabin heating and air conditioning system shall be located above the engine tunnel area. The system covers and plenums shall be of severe duty design made of aluminum which shall be coated with a customer specified interior paint. The design of the system's covers shall provide quick access to washable air intake filters as well as easy access to other serviceable items.

Six (6) adjustable louvers shall provide comfort for the front seat occupants and ten (10) adjustable louvers shall provide comfort for the rear crew occupants. The plenum shall be shortened to terminate in the mid crew area on cabs with 10.00 inch raised roofs and greater. This shortened plenum shall allow for the customer to utilize the upper rear center wall for compartmentation, equipment, or apparatus operations.

Separate front and rear blower motors shall be of brushless design and shall be controlled independently. It shall be capable of reducing the interior cabin air temperature from 122˚ F (+/- 3˚ F) to 80˚ F in thirty minutes with 50% relative humidity and full solar load as described in SAE J2646.

The system shall also provide heater pull up performance which meets or exceeds the performance requirements of SAE J1612 as well as defrost performance that meets or exceeds the performance requirements of SAE J381.

A gravity drain system shall be provided that is capable of evacuating condensate from the vehicle while on a slope of up to a 13% grade in any direction.

The air conditioning system plumbing shall be a mixture of custom bent zinc coated steel fittings and Aeroquip flexible hose with Aeroquip EZ-Clip fittings.

The overhead heater/defroster plumbing shall include an electronic flow control valve that re-directs hot coolant away from the evaporator, via a bypass loop, as the temperature control is moved toward the cold position.

Any component which needs to be accessed to perform system troubleshooting shall be accessible by one person using basic hand tools. Regularly serviced items shall be replaceable by one person using basic hand tools.
Spartan Motors Inc. recommends that the overall climate system performance be based off third-party testing in accordance to Society of Automotive Engineering standards as a complete system. Individual component level BTU ratings is not an accurate indicator of the performance capability of the completed system. System individual component BTU ratings:

- Air conditioning evaporator total BTU/HR: 82,000
- Air conditioning condenser total BTU/HR: 59,000
- Heater coil total BTU/HR: 98,000

Performance data specified is based on testing performed by an independent third-party test facility using a medium four-door 10” Raised roof Gladiator chassis equipped with an ISL engine.

**CLIMATE CONTROL DRAIN**

The climate control system shall include a gravity drain for water management. The gravity drain shall remove condensation from the air conditioning system without additional mechanical assistance.

**CLIMATE CONTROL ACTIVATION**

The heating, defrosting and air conditioning controls shall be in the center dash center switch panel, in a position which is easily accessible to the driver. The climate control shall be activated by a rotary switch.

**HVAC OVERHEAD COVER PAINT**

The overhead HVAC cover shall be painted with an easy-to-clean gray texture finish.

**A/C CONDENSER LOCATION**

A roof mounted A/C condenser shall be installed centered on the cab forward of the raised roof against the slope rise.

**A/C COMPRESSOR**

The air-conditioning compressor shall be a belt driven, engine mounted compressor. The compressor shall be compatible with R134-a refrigerant.

**UNDER CAB INSULATION**

The underside of the cab tunnel surrounding the engine shall be lined with multi-layer insulation, engineered for application inside diesel engine compartments.

The insulation shall act as a noise barrier, absorbing noise thus keeping the decibel level in the cab well within NFPA recommendations. As an additional benefit, the insulation shall assist in sustaining the desired temperature within the cab interior.

The engine tunnel insulation shall measure approximately 0.30 inch thick including a multi-layer foil faced glass cloth and polyester fiber layer. The foil surface acts as protection against heat, moisture and other contaminants. The insulation shall meet or exceed FMVSS 302 flammability test.
The insulation shall be cut precisely to fit each section and sealed for additional heat and sound deflection. The insulation shall be held in place by acrylic pressure sensitive adhesive.

**INTERIOR TRIM FLOOR**

The floor of the cab shall be covered with a multi-layer mat consisting of 0.25 inch thick sound absorbing closed cell foam with a 0.06 inch thick non-slip vinyl surface with a pebble grain finish. The covering shall be held in place by a pressure sensitive adhesive and aluminum trim molding. All exposed seams shall be sealed with silicone caulk matching the color of the floor mat to reduce the chance of moisture and debris retention.

**INTERIOR TRIM**

The cab interior shall include trim on the front ceiling, rear crew ceiling, and the cab walls. It shall be easily removable to assist in maintenance. The trim shall be constructed of insulated vinyl over a hard board backing.

**REAR WALL INTERIOR TRIM**

The rear wall of the cab shall be trimmed with vinyl.

**HEADER TRIM**

The cab interior shall feature header trim over the driver and officer dash constructed of 5052-H32 Marine Grade, 0.13 inch thick aluminum.

**TRIM CENTER DASH**

The main center dash area shall be constructed of 5052-H32 Marine Grade, 0.13 inch thick aluminum plate. There shall be four (4) holes located on the top of the dash near each outer edge of the electrical access cover for ventilation. The center dash electrical access cover shall include a gas cylinder stay which shall hold the cover open during maintenance.

**TRIM LH DASH**

The left hand dash shall be constructed of 5052-H32 Marine Grade, 0.13 inch thick aluminum plate for a perfect fit around the instrument panel. For increased occupant protection the extreme duty left hand dash utilizes patent pending break away technology to reduce rigidity in the event of a frontal crash. The left hand dash shall offer lower vertical surface area to the left and right of the steering column to accommodate control panels.

**TRIM RH DASH**

The right hand dash shall be constructed of 5052-H32 Marine Grade, 0.13 of an inch thick aluminum plate and shall include a glove compartment with a hinged door and a Mobile Data Terminal (MDT) provision. The glove compartment size will measure 14.00 inches wide X 6.38 inches high X 5.88 inches deep. The MDT provision shall be provided above the glove compartment.

**ENGINE TUNNEL TRIM**

The cab engine tunnel shall be covered with a multi-layer mat consisting of 0.25 inch closed cell foam with a 0.06 inch thick non-slip vinyl surface with a pebble grain finish. The mat shall be held in place by pressure sensitive adhesive. The engine tunnel mat shall be trimmed with anodized aluminum stair nosing trim for an aesthetically pleasing appearance.
ENGINE TUNNEL ACCESSORIES

The engine tunnel shall feature a fabricated aluminum console which shall include a large storage bin with dividers and a map compartment. The large bin is equipped with a hinged lid and is secured with two compression clamps. There shall be two (2) cup holders included in the console.

POWER POINT DASH MOUNT

The cab shall include one (1) 12 volt cigarette lighter type receptacles in the switch panel to provide a power source for 12 volt electrical equipment. The cab shall also include two (2) Blue Sea dual universal serial bus (USB) charging receptacles in the cab dash switch panel to provide a power source for USB chargeable electrical equipment. The USB ports shall be capable of a 5 Volt-2.1 amp total output. The receptacles shall be wired battery direct.

STEP TRIM

Each cab entry door shall include a three step entry. The first step closest to the ground shall be constructed of SAE 304 stainless steel with embossed perforations and diamond shaped cutout. The perforations and cutouts shall allow water and other debris to flow through rather than becoming trapped within the stepping surface. The step shall feature a splash guard to reduce water and debris from splashing in to the step. The splash guard shall have drainage holes beneath the back of the step to allow debris and water to flow through rather than becoming trapped within the stepping surface. The stainless steel material shall have a number 8 mirror finish. The lower step shall be mounted to a frame which is integral with the construction of the cab for rigidity and strength. The middle step shall be integral with the cab construction and shall be trimmed with a Flex-Tred® adhesive grit surface material.

UNDER CAB ACCESS DOOR

The cab shall include an aluminum access door in the left crew step riser painted to match the cab interior paint with a push and turn latch. The under cab access door shall provide access to the diesel exhaust fluid fill.

INTERIOR DOOR TRIM

The interior trim on the doors of the cab shall consist of an aluminum panel constructed of Marine Grade 5052-H32 0.13 of an inch thick aluminum plate. The door panels shall include a painted finish.

DOOR TRIM CUSTOMER NAMEPLATE

The interior door trim on the front doors shall include a customer nameplate which states the vehicle was custom built for their Department.

CAB DOOR TRIM REFLECTIVE

The interior of each door shall include high visibility reflective tape. A white reflective tape shall be provided vertically along the rear outer edge of the door. The lowest portion of each door skin shall include a reflective tape chevron with red and white stripes and a Spartan logo. The chevron tape shall measure 6.00 inches in height.

INTERIOR GRAB HANDLE "A" PILLAR

There shall be two (2) rubber covered 11.00 inch grab handles installed inside the cab, one on each “A” post at the left and right door openings. The left handle shall be located 7.88 inches above the bottom of the door window opening and the right handle shall be located 2.88 inches above the bottom of the door window opening. The handles shall assist personnel in entering and exiting the cab.
INTERIOR GRAB HANDLE FRONT DOOR

Each front door shall include one (1) ergonomically contoured 9.00 inch cast aluminum handle mounted horizontally on the interior door panels. The handles shall feature a textured black powder coat finish to assist personnel entering and exiting the cab.

INTERIOR GRAB HANDLE REAR DOOR

A black powder coated cast aluminum assist handle shall be provided on the inside of each rear crew door. A 30.00 inch long handle shall extend horizontally the width of the window just above the window sill. The handle shall assist personnel in exiting and entering the cab.

INTERIOR REAR WALL COMPARTMENT

The cab shall include a compartment located in the center of the rear wall of the cab. This compartment shall measure 65.00 inches high X 37.00 inches wide X 20.00 inches deep. The compartment shall be accessible from the interior of the cab through an ROM Series IV roll up style door.

The compartment shall include three (3) aluminum shelves which shall be secured using Unistrut® channel on two (2) sides of the interior walls of the compartment. The shelves shall feature a 1.00 inch tall lip around the edges.

INTERIOR REAR WALL COMPARTMENT INTERIOR FINISH

The interior of the interior rear wall compartment shall feature an easy-to-clean gray textured finish.

INTERIOR REAR WALL COMPARTMENT LIGHTING

There shall be one (1) SoundOff Signal brand LED strip light installed to illuminate the interior compartment at the rear wall inside the crew area of the cab. The strip light shall be 43.00 inches long and shall include twelve (12) bright white Gen3 LEDs.

INTERIOR MID COMPARTMENT

The cab shall include a compartment located in the middle of the cab behind the engine tunnel adjacent to the rear facing outboard seating positions. This compartment shall measure the full width of the engine tunnel, 22 inches high, the depth shall follow the contour of the engine tunnel. The compartment shall be accessible from the interior of the cab through a rear facing opening which shall be secured by a black webbing restraint. Both the interior of the compartment and the exterior of the compartment shall be painted to match the cab interior paint.

INTERIOR MID COMPARTMENT SHELF

The compartment located behind the engine tunnel shall include one (1) aluminum shelf which shall be secured using Unistrut channel on two (2) sides of the interior walls of the compartment. The shelf shall feature a 1.00 inch lip around the edges.

INTERIOR MID COMPARTMENT LIGHTING

The interior portion of the interior compartment behind the engine tunnel inside the crew area of the cab shall include compartment door activated On-Scene brand Access LED lighting which shall be sized appropriately to illuminate all usable surfaces within the compartment.
**INTERIOR SOFT TRIM COLOR**

The cab interior soft trim surfaces shall be gray in color.

**INTERIOR TRIM SUNVISOR**

The header shall include two (2) sun visors, one each side forward of the driver and officer seating positions above the windshield. Each sun visor shall be constructed of Masonite and covered with padded vinyl trim.

**INTERIOR FLOOR MAT COLOR**

The cab interior floor mat shall be gray in color.

**CAB PAINT INTERIOR DOOR TRIM**

The inner door panel surfaces shall be painted with an easy clean-to-clean gray texture finish.

**HEADER TRIM INTERIOR PAINT**

The metal surfaces in the header area shall be coated with an easy-to-clean gray texture finish.

**TRIM CENTER DASH INTERIOR PAINT**

The entire center dash shall be coated with an easy-to-clean matte gray texture finish. Any accessory pods attached to the dash shall also be painted this color.

**TRIM LH DASH INTERIOR PAINT**

The left hand dash shall be painted with an easy-to-clean matte gray texture finish.

**TRIM RIGHT HAND DASH INTERIOR PAINT**

The right hand dash shall be painted with an easy-to-clean matte gray texture finish.

**ENGINE TUNNEL ACCESSORIES PAINT**

The engine tunnel accessories shall feature an easy-to-clean gray textured finish.

**DASH PANEL GROUP**

The main center dash area shall include three (3) removable panels located one (1) to the right of the driver position, one (1) in the center of the dash and one (1) to the left of the officer position. The center panel shall be within comfortable reach of both the driver and officer.

**SWITCHES CENTER PANEL**

The center dash panel shall include six (6) switch positions in the upper left portion of the panel.

A rocker switch with a blank legend installed directly above shall be provided for any position without a switch and legend designated by a specific option. The non-specified switches shall be two-position, black switches with a green indicator.
Each blank switch legend can be custom engraved by the body manufacturer. All switch legends shall have backlighting provided.

**SWITCHES LEFT PANEL**

The left dash panel shall include four (4) switches. There shall be three (3) across the top of the panel with one (1) below. Two (2) of the top row of switches shall be rocker type and the left one (1) shall be the windshield wiper/washer control switch. The lower switch shall be a rocker type switch.

A rocker switch with a blank legend installed directly above shall be provided for any position not designated by a specific option. The non-designated switches shall be two-position, black switches with a green indicator light. Each blank switch legend can be custom engraved by the body manufacturer. All switch legends shall have backlighting provided.

**SWITCHES RIGHT PANEL**

The right dash panel shall include no rocker switches or legends.

**SEAT BELT WARNING**

A Weldon seat belt warning system, integrated with the Vehicle Data Recorder system, shall be installed for each seat within the cab. The system shall provide a visual warning indicator in the Vista display and control screen(s).

The warning system shall activate when any seat is occupied with a minimum of 60 pounds, the corresponding seat belt remains unfastened, and the park brake is released. The warning system shall also activate when any seat is occupied, the corresponding seat belt was fastened in an incorrect sequence, and the park brake is released. Once activated, the visual indicators and applicable audible alarm shall remain active until all occupied seats have the seat belts fastened.

**SEAT MATERIAL**

The Bostrom Firefighter seats shall include a covering of extra high strength, wear resistant fabric made of durable low seam Durawear Plus™ ballistic polyester. A PVC coating shall be bonded to the back side of the material to help protect the seats from UV rays and from being saturated or contaminated by fluids. Durawear Plus™ meets or exceeds specification of the common trade name Imperial 1800. The material meets FMVSS 302 flammability requirements. *If applicable, Theatre style seats located in the cab shall be high strength, wear resistant fabric made of durable ballistic polyester. A PVC coating shall be bonded to the back side of the material to help protect the seats from UV rays and from being saturated or contaminated by fluids. Common trade names for this material are Imperial 1200 and Durawear.*

**SEAT COLOR**

All seats supplied with the chassis shall be gray in color. All seats shall include red seat belts.

**SEAT BACK LOGO**

The seat back shall include the “Spartan” logo. The logo shall be centered on the standard headrest of the seat back and on the left side of a split headrest.

**SEAT DRIVER**

The driver's seat shall be an H.O. Bostrom 400 Series Sierra model seat with air suspension. The four-way seat shall feature 3.00 inch vertical travel air suspension and manual fore and aft adjustment with 5.00 inches of travel. The suspension control shall be located on the seat below the left front corner of the bottom cushion. The seat shall also feature integral springs to isolate shock.
The seat position shall include a three-point shoulder harness with lap belt and an automatic retractor attached to the cab. The buckle portion of the seat belt shall be mounted on a semi-rigid stalk extending from the seat base within easy reach of the occupant.

The minimum vertical dimension from the seat H-point to the ceiling for this belted seating position shall be 37.00 inches measured with the seat suspension height adjusted to the upper limit of its travel.

This model of seat shall have successfully completed the static load tests set forth by FMVSS 207, 209, and 210 in effect at the time of manufacture. This testing shall include a simultaneous forward load of 3000 pounds each on the lap and shoulder belts and twenty (20) times the weight through the center of gravity.

The materials used in construction of the seat shall also have successfully completed testing with regard to the flammability of materials used in the occupant compartments of motor vehicles as outlined in FMVSS 302, of which dictates the allowable burning rate of materials in the occupant compartments of motor vehicles.

SEAT BACK DRIVER

The driver’s seat shall feature a two (2) way adjustable lumbar support and offer an infinite fully reclining adjustable titling seat back. The seat back shall also feature a contoured head rest.

SEAT MOUNTING DRIVER

The driver’s seat shall be installed in an ergonomic position in relation to the cab dash.

OCCUPANT PROTECTION DRIVER

The driver’s position shall be equipped with the Advanced Protection System™ (APS). The APS shall selectively deploy integrated systems to protect against injuries in qualifying frontal impact, side impact, and rollover events. The increase in survivable space and security of the APS shall also provide ejection mitigation protection.

The driver’s seating area APS shall include:

- Advanced seat belt system - retractor pre-tensioner tightens the seat belt around the driver, securing the occupant in the seat and the load limiter plays out some of the seat belt webbing to reduce seat belt to chest and torso force upon impact as well as mitigate head and neck injuries.

- Large side curtain airbag - protects the driver’s head, neck, and upper body from dangerous cab side surfaces and contact points with intrusive surfaces as a result of a collision as well as provides ejection mitigation protection to the driver in a qualifying event by covering the window and the upper portion of the door.

- Dual knee airbags (patent pending) with energy management mounting (patent pending) - protects the driver’s lower body from dangerous surface contact injuries, acceleration injuries, and from intrusion as well as locks the lower body in place so the upper body shall be slowed by the load limiting seat belt.

Steering wheel airbag - protects the driver’s head, neck, and upper torso from contact injuries, acceleration injuries, and contact points with intrusive surfaces as a result of a collision.

SEAT OFFICER

The officer's seat shall be a H.O. Bostrom 500 Series Sierra seat model. The seat shall feature a tapered and padded seat, and cushion. The seat shall be mounted in a fixed position.

The seat shall feature an all belts to seat (ABTS) style of safety restraint. The ABTS feature shall include a three-point shoulder harness with the lap belt and automatic retractor as an integral part of the seat assembly. The buckle portion of the seat belt shall extend from the seat base towards the driver position within easy reach of the occupant. The ABTS feature shall also include the RiteRite™ shoulder adjustment feature to provide enhanced comfort and safety by allowing customized seat belt fit.
The minimum vertical dimension from the seat H-point to the ceiling for this belted seating position shall be 35.00 inches.

This model of seat shall have successfully completed the static load tests by FMVSS 207/210. This testing shall include a simultaneous forward load of 3000 pounds each on the lap and shoulder belts and twenty (20) times the weight through the center of gravity. This model of seat installed in the cab model, as specified, shall have successfully completed the dynamic sled testing using FMVSS 208 as a guide with the following accommodations. In order to reflect the larger size outfitted firefighters, the test dummy used shall be a 95th percentile hybrid III male weighing 225 pounds rather than the 50th percentile male dummy weighing 165 pounds as referenced in FMVSS 208. The model of seats shall also have successfully completed the flammability of materials used in the occupant compartments of motor vehicles as outlined in FMVSS 302, of which decides the burning rate of materials in the occupant compartments of motor vehicles.

**SEAT BACK OFFICER**

The officer’s seat back shall include an IMMI brand SmartDock® Gen 2 hands-free self contained breathing apparatus (SCBA) holder. The hands-free holder shall meet NFPA 1901-03 9G dynamic requirements for cylinder restraint systems for use in crew compartments of emergency response vehicles. The bracket shall accommodate and secure most types of self-contained breathing apparatus cylinders.

The hands-free holder shall consist of a back plate, bottom cradle, non-marring top claws, and claw height adjustment knob. The height adjustment knob shall allow for easy adjustment of the claws to the SCBA. The hands-free holder’s claws shall lock from inertial forces to prevent the SCBA from becoming a projectile in the event of a crash to meet the NFPA 1901-03 standard for SCBA retention. The SCBA holder shall offer single-motion insertion into the claws and hands-free release when the SCBA fitted seat occupant rises.

The seat back shall include a removable padded cover which shall be provided over the SCBA cavity.

**SEAT MOUNTING OFFICER**

The officer’s seat shall be installed in an ergonomic position in relation to the cab dash.

**OCCUPANT PROTECTION OFFICER**

The officer’s position shall be equipped with the Advanced Protection System™ (APS). The APS shall selectively deploy integrated systems to protect against injuries in qualifying frontal impact, side impact, and rollover events. The increase in survivable space and security of the APS shall also provide ejection mitigation protection.

The officer’s seating area APS shall include:

- Advanced seat belt system - retractor pre-tensioner tightens the seat belt around the officer, securing the occupant in the seat and the load limiter plays out some of the seat belt webbing to reduce seat belt to chest and torso force upon impact as well as mitigate head and neck injuries.

- Large side curtain airbag - protects the officer’s head, neck, and upper body from dangerous cab side surfaces and contact points with intrusive surfaces as a result of a collision as well as provides ejection mitigation protection to the officer in a qualifying event by covering the window and the upper portion of the door.

Knee airbags - protects the officer's lower body from dangerous surface contact injuries, acceleration injuries, and from contact points with intrusive surfaces as a result of a collision as well as locks the lower body in place so the upper body shall be slowed by the load limiting seat belt.

**SEAT BELT ORIENTATION CREW**

The crew position seat belts shall follow the standard orientation which extends from the outboard shoulder extending to the inboard hip.
The crew area shall include two (2) rear facing crew seats, which include one (1) located directly behind the left side front seat and one (1) located directly behind the right side front seat.

SEAT CREW REAR FACING OUTER

The crew area shall include a seat in the rear facing outboard position which shall be a H.O. Bostrom 500 Series Firefighter model seat. The seat shall feature a tapered and padded seat, and cushion. The seat shall be mounted in a fixed position.

The seat shall feature an all belts to seat (ABTS) style of safety restraint. The ABTS feature shall include a three-point shoulder harness with the lap belt and automatic retractor as an integral part of the seat assembly. The buckle portion of the seat belt shall extend from the seat base towards the driver position within easy reach of the occupant. The ABTS feature shall also include the RiteHite™ shoulder adjustment feature to provide enhanced comfort and safety by allowing customized seat belt fit.

The minimum vertical dimension from the seat H-point to the ceiling for this belted seating position shall be 35.00 inches.

This model of seat shall have successfully completed the static load tests by FMVSS 207/210. This testing shall include a simultaneous forward load of 3000 pounds each on the lap and shoulder belts and twenty (20) times the weight through the center of gravity. This model of seat installed in the cab model, as specified, shall have successfully completed the dynamic sled testing using FMVSS 208 as a guide with the following accommodations. In order to reflect the larger size outfitted firefighters, the test dummy used shall be a 95th percentile hybrid III male weighing 225 pounds rather than the 50th percentile male dummy weighing 165 pounds as referenced in FMVSS 208. The model of seats shall also have successfully completed the flammability of materials used in the occupant compartments of motor vehicles as outlined in FMVSS 302, of which decides the burning rate of materials in the occupant compartments of motor vehicles.

SEAT BACK REAR FACING OUTER

The crew area seat backs shall include an IMMI brand SmartDock® Gen 2 hands-free self contained breathing apparatus (SCBA) holder. The hands-free holder shall meet NFPA 1901-03 9G dynamic requirements for cylinder restraint systems for use in crew compartments of emergency response vehicles. The bracket shall accommodate and secure most types of self-contained breathing apparatus cylinders.

The hands-free holder shall consist of a back plate, bottom cradle, non-marring top claws, and claw height adjustment knob. The height adjustment knob shall allow for easy adjustment of the claws to the SCBA. The hands-free holder's claws shall lock from inertial forces to prevent the SCBA from becoming a projectile in the event of a crash to meet the NFPA 1901-03 standard for SCBA retention. The SCBA holder shall offer single-motion insertion into the claws and hands-free release when the SCBA fitted seat occupant rises.

The seat back shall include a removable padded cover which shall be provided over the SCBA cavity.

SEAT MOUNTING REAR FACING OUTER

The rear facing outer seats shall offer special mounting positions which shall be 2.00 inches towards the rear wall offering additional space between the front seats and the outer rear facing seats.

OCCUPANT PROTECTION RFO

The rear facing outer seat position(s) shall be equipped with the Advanced Protection System™ (APS). The APS shall selectively deploy integrated systems to protect against injuries in qualifying frontal impact, side impact, and rollover events. The increase in survivable space and security of the APS shall also provide ejection mitigation protection.

Each rear facing outer seating position APS shall include:
- APS advanced seat belt system - retractor pre-tensioners tighten the seat belts around each occupant, securing the occupants in seats and load limiters play out some of the seat belt webbing to reduce seat belt to chest and torso force upon impact as well as mitigate head and neck injuries.

Side curtain airbag - protects each occupant's head, neck, and upper body from dangerous cab side surfaces and contact points with intrusive surfaces as a result of a collision as well as provides ejection mitigation protection to each occupant in a qualifying event by covering the windows and walls adjacent to each seating position with an airbag custom designed for each cab configuration.

**CAB FRONT UNDERSEAT STORAGE ACCESS**

The left and right under seat storage areas shall have a solid aluminum hinged door with non-locking latch.

**SEAT COMPARTMENT DOOR FINISH**

All underseat storage compartment access doors shall have an easy-to-clean gray texture finish.

**WINDSHIELD WIPER SYSTEM**

The cab shall include a triple arm linkage wiper system which shall clear the windshield of water, ice and debris. There shall be two (2) windshield wipers; each shall be affixed to a radial arm. The wiper motor shall be activated by an intermittent wiper control located within easy reach of the driver’s position.

**ELECTRONIC WINDSHIELD FLUID LEVEL INDICATOR**

The windshield washer fluid level shall be monitored electronically. When the washer fluid level becomes low the yellow “Check Message Center” indicator light on the instrument panel shall illuminate and the message center in the dual air pressure gauge shall display a “Check Washer Fluid Level” message.

**CAB DOOR HARDWARE**

The cab entry doors shall be equipped with exterior pull handles, suitable for use while wearing firefighter gloves. The handles shall be made of a fiber reinforced plastic composite with a black matt finish.

The interior exit door handles shall be flush paddle type with a black finish, which are incorporated into the upper door panel.

All cab entry doors shall include locks which are keyed alike. The door locks shall be designed to prevent accidental lockout.

**DOOR LOCKS**

Each cab entry door shall include a manually operated door lock. Each door lock may be actuated from the inside of the cab by means of a red knob located on the paddle handle of the respective door or by using a TriMark key from the exterior. The door locks are designed to prevent accidental lockout.

**GRAB HANDLES**

The cab shall include one (1) 18.00 inch knurled, anti-slip, one-piece exterior assist handle behind each cab door. The grab handle shall be made of SAE 304 stainless steel and be 1.25 inch diameter to enable non-slip assistance with a gloved hand.
REARVIEW MIRRORS

Retrac Aerodynamic West Coast style single vision mirror heads model 613285 shall be provided and installed on each of the front cab doors.

The mirrors shall be mounted via 1.00 inch diameter tubular stainless steel arms to provide a rigid mounting to reduce mirror vibration.

The mirrors shall measure 8.00 inches wide X 19.00 inches high and shall include an 8.00 inch convex mirrors with a stainless steel back, model 980-4, installed below the flat glass to provide a wider field of vision. The flat mirrors shall be motorized with remote horizontal and vertical adjustment. The control switches shall be mounted within easy reach of the driver. The convex mirrors shall be manually adjustable. The flat mirror glass shall be heated for defrosting in severe cold weather conditions.

The mirror backs shall be constructed of vacuum formed chrome plated ABS plastic housings that are corrosion resistant and shall include an amber marker light. The mirrors shall be manufactured with the finest quality non-glare glass.

REARVIEW MIRROR HEAT SWITCH

The heat for the rearview mirrors shall be controlled through a virtual button on the Vista display and control screen.

CAB FENDER

Full width wheel well liners shall be installed on the extruded cab to limit road splash and enable easier cleaning. Each two-piece liner shall consist of an inner liner 16.00 inches wide made of vacuum formed ABS composite and an outer fenderette 3.50 inches wide made of SAE 304 polished stainless steel.

MUD FLAPS FRONT

The front wheel wells shall have mud flaps installed on them.

CAB EXTERIOR FRONT & SIDE EMBLEMS

The cab shall include three (3) Spartan emblems. There shall be one (1) installed on the front air intake grille and two (2) for the exterior sides of the cab shipped loose with the chassis for installation by the body manufacturer. The cab shall also include one (1) Advanced Protection System shield emblem on each front door.

IGNITION

A master battery system with a keyless start ignition system shall be provided. Each system shall be controlled by a one-quarter turn Cole Hersee switch, both of which shall be mounted to the left of the steering wheel on the dash. A chrome push type starter button shall be provided adjacent to the master battery and ignition switches.

Each switch shall illuminate a green LED indicator light on the dash when the respective switch is placed in the “ON” position.

The starter button shall only operate when both the master battery and ignition switches are in the “ON” position.

BATTERY

The single start electrical system shall include six (6) Harris BCI 31 925 CCA batteries with a 210 minute reserve capacity and 4/0 welding type dual path starter cables per SAE J541.
The batteries shall be installed within two (2) steel battery trays located on the left side and right side of the chassis, securely bolted to the frame rails. The battery trays shall be coated with the same material as the frame.

The battery trays shall include drain holes in the bottom for sufficient drainage of water. A durable, non-conducting, interlocking mat made by Dri-Dek shall be installed in the bottom of the trays to allow for air flow and help prevent moisture build up. The batteries shall be held in place by non-conducting phenolic resin hold down boards.

Each battery box shall include a steel cover which protects the top of the batteries. Each cover shall include flush latches which shall keep the cover secure as well as a black powder coated handle for convenience when opening.

The starting system shall include cables which shall be protected by 275 degree F. minimum high temperature flame retardant loom, sealed at the ends with heat shrink and sealant.

The starting system shall include battery jumper studs. These studs shall be located in the forward most portion of the driver's side lower step, 8.00 inches apart. The studs shall allow the vehicle to be jump started, charged, or the cab to be raised in an emergency in the event of battery failure.

The charging system shall include a 320 amp Leece-Neville 12 volt alternator. The alternator shall include a self-exciting integral regulator.

The single start electrical system shall include a Delco brand starter motor.

A Kussmaul Auto Charge 40 LPC battery conditioner shall be supplied. The battery conditioner shall provide a 40 amp output for the chassis batteries and a 15 amp output circuit for accessory loads. The battery conditioner shall be mounted in the cab in the LH rear facing outer seating position.

A Kussmaul battery conditioner display shall be supplied. The battery conditioner display shall be mounted in the cab, viewable through the cab mid side window behind the left front door.

A Kussmaul Pump 12V air compressor shall be supplied. The air compressor shall be installed behind the driver's seat. The air compressor shall be plumbed to the air brake system to maintain air pressure. The air compressor shall include an auto drain as an extra precaution to prevent moisture from entering the air system. The automatic moisture drain shall be plumbed into the system between the auxiliary air compressor pump and the air tanks.
ELECTRICAL INLET LOCATION

An electrical inlet shall be installed on the left hand side of cab over the wheel well.

ELECTRICAL INLET

A Kussmaul 20 amp super auto-eject electrical receptacle shall be supplied. It shall automatically eject the plug when the starter button is depressed.

A single item or an addition of multiple items must not exceed the rating of the electric inlet that it’s connected to.

Amp Draw Reference List:
Kussmaul 40 LPC Charger - 5 Amps
Kussmaul 40/20 Charger - 8.5 Amps
Kussmaul 80 LPC Charger - 13 Amps
Kussmaul EV-40 - 6.2 Amps
Blue Sea P12 7532 - 7.5 Amps
Iota DLS-45/IQ4 - 11 Amps
1000W Engine Heater - 8.33 Amps
1500W Engine Heater - 12.5 Amps
120V Air Compressor - 4.2 Amps
120V Dometic HVAC - 15 Amps

ELECTRICAL INLET CONNECTION

The electrical inlet shall be connected to the battery conditioner.

ELECTRICAL INLET COLOR

The electrical inlet connection shall include a yellow cover.

HEADLIGHTS

The cab front shall include four (4) rectangular LED headlamps with separate high and low beams mounted in bright chrome bezels. Each lamp shall include a heating system that de-ices the headlight.

HEADLIGHT LOCATION

The headlights shall be located on the front fascia of the cab directly below the front warning lights.

FRONT TURN SIGNALS

The front fascia shall include two (2) Whelen model 600 4.00 inches X 6.00 inches programmable amber LED turn signals which shall be installed in an outboard position within the front fascia chrome bezel.

SIDE TURN/MARKER LIGHTS

The sides of the cab shall include two (2) Tecniq S170 LED side marker lights which shall be provided just behind the front cab radius corners. The lights shall be amber with chrome bezels.
MARKER AND ICC LIGHTS

In accordance with FMVSS, there shall be five (5) Tecniq S170 LED cab marker lamps designating identification, center and clearance provided. These lights shall be installed on the face of the cab within full view of other vehicles from ground level. The lights shall be amber with chrome bezels.

HEADLIGHT AND MARKER LIGHT ACTIVATION

The headlights and marker lights shall be controlled via a virtual button on the Vista display. There shall be a virtual dimmer control on the Vista display to adjust the brightness of the dash lights. The headlamps shall be equipped with the "Daytime Running" light feature, which shall illuminate the headlights when the ignition switch is in the "On" position and the parking brake is released.

INTERIOR OVERHEAD LIGHTS

The cab shall include a two-section, red and clear Weldon LED dome lamp located over each door. The dome lamps shall be rectangular in shape and shall measure approximately 7.00 inches in length X 3.00 inches in width with a black colored bezel. The clear portion of each lamp shall be activated by opening the respective door and via the multiplex display and both the red and clear portion can be activated by individual push lenses on each lamp.

An additional incandescent three (3) light module with dual map lights shall be located over the engine tunnel which can be activated by individual switches on the lamp.

LIGHTBAR PROVISION

There shall be one (1) light bar installed on the cab roof. The light bar shall be provided and installed by the chassis manufacturer. The light bar installation shall include a lowered mounting that shall place the light bar just above the junction box and wiring to a control switch on the cab dash.

CAB FRONT LIGHTBAR MODEL

The cab shall be provided with one (1) Whelen model F4N72 light bar. The light bar shall be 72.00 inches in length and feature eighteen (18) customizable pods.

See the light bar layout for specific details.

LIGHTBAR SWITCH

The light bar shall be controlled through the master warning switch.

FRONT SCENE LIGHTS

The front of the cab shall include two (2) Whelen Pioneer model PCH2 contour roof mount scene lights installed on the brow of the cab.

Each 150 watt lamp head shall incorporate a 12 volt DC Super-LED combination flood/spot light installed in a die-cast aluminum housing. Each lamp head shall use a collimator/metalized redux spot/flood reflector assembly with Proclera™ silicone optics and a clear non-optic polycarbonate lens. The lens/reflector assembly shall utilize a liquid injected molded silicone gasket to be resistant to water, moisture, dust, and other environmental conditions. The PCH2 shall be vibration resistant. The Pioneer PC boards shall be conformal coated for additional protection. Each combination flood/spot light lamp head shall draw 13.0 amps in spotlight mode and generate 17,750 lumens total. Each lamp head shall measure 4.25 inches in height X 14.00 inches in width. The lamp heads and brackets shall be powder coated white.
FRONT SCENE LIGHT LOCATION

There shall be two (2) scene lights mounted to the front brow of the cab inboard of the outer front marker lights.

Y__ N__

FRONT SCENE LIGHTS ACTIVATION

The front scene lighting shall be activated by a virtual button on the Vista display and control screen.

Y__ N__

GROUND LIGHTS

The ground lighting shall be activated when the parking brake is set, by the opening of the door on the respective cab side, and through a virtual button on the Vista display and control screen.

Y__ N__

GROUND LIGHTS

Each door shall include a Tecniq T44 LED ground light mounted to the underside of the cab step below each door. The lights shall include a polycarbonate lens, a housing which is vibration welded and LEDs which shall be shock mounted for extended life.

Y__ N__

LOWER CAB STEP LIGHTS

The middle step located at each door shall include a Tecniq T44 LED light which shall activate with the opening of the respective door. The lights shall include a polycarbonate lens, a housing which is vibration welded and LEDs which shall be shock mounted for extended life.

Y__ N__

INTERMEDIATE STEP LIGHTS

The intermediate step well area at each door shall include a TecNiq D06 LED light within a chrome housing. The egress step lights shall provide visibility to the step well area for the first step exiting the vehicle. The egress step lights shall activate with entry step lighting.

Y__ N__

ENGINE COMPARTMENT LIGHT

There shall be a LED NFPA compliant light mounted under the engine tunnel for area work lighting on the engine. The light shall include a polycarbonate lens, a housing which is vibration welded and a bulb which shall be shock mounted for extended life. The light shall activate automatically when the cab is tilted.

Y__ N__

DO NOT MOVE APPARATUS LIGHT

The front headliner of the cab shall include a flashing red TecNiq K50 LED light clearly labeled "Do Not Move Apparatus". In addition to the flashing red light, an audible alarm shall be included which shall sound while the light is activated.

The flashing red light shall be located centered left to right for greatest visibility.

The light and alarm shall be interlocked for activation when either a cab door is not firmly closed, or an apparatus compartment door is not closed, and the parking brake is released.

Y__ N__

MASTER WARNING SWITCH

A master switch shall be included, as a virtual button on the Vista display and control screen which shall be labeled “E Master” for identification. The button shall feature control over all devices wired through it. Any warning device switches left in the “ON” position when the master switch is activated shall automatically power up.

Y__ N__
**HEADLIGHT FLASHER**

An alternating high beam headlight flashing system shall be installed into the high beam headlight circuit which shall allow the high beams to flash alternately from left to right.

Deliberate operator selection of high beams will override the flashing function until low beams are again selected. Per NFPA, these clear flashing lights will also be disabled “On Scene” when the park brake is applied.

**HEADLIGHT FLASHER SWITCH**

The flashing headlights shall be activated through a virtual button on the Vista display and control screen.

**INBOARD FRONT WARNING LIGHTS**

The cab front fascia shall include two (2) Whelen C6 SurfaceMax™ series Super LED front warning lights in the left and right inboard positions. The lights shall feature multiple flash patterns including steady burn for solid colors and multiple flash patterns for split colors. The lights shall be mounted to the front fascia of the cab within a chrome bezel.

**INBOARD FRONT WARNING LIGHTS COLOR**

The warning lights mounted on the cab front fascia in the inboard positions shall be red.

**FRONT WARNING SWITCH**

The front warning lights shall be controlled through the master warning switch.

**INTERSECTION WARNING LIGHTS**

The chassis shall include two (2) Whelen C6 SurfaceMax series Super LED intersection warning lights, one (1) each side. The lights shall feature multiple flash patterns including steady burn for solid colors and multiple flash patterns for split colors. The lights shall be mounted within a chrome bezel.

**INTERSECTION WARNING LIGHTS COLOR**

The intersection lights shall be red.

**INTERSECTION WARNING LIGHTS LOCATION**

The intersection lights shall be mounted on the side of the bumper in the rearward position.

**SIDE WARNING LIGHTS**

The cab sides shall include two (2) Whelen C6 SurfaceMax series Super LED warning lights, one (1) on each side. The lights shall feature multiple flash patterns including steady burn. The lights shall be mounted to the sides of the cab within a chrome bezel.

**SIDE WARNING LIGHTS COLOR**

The warning lights located on the side of the cab shall be red.
**SIDES WARNING LIGHTS LOCATION**

The warning lights on the side of the cab shall be mounted over the front wheel well directly over the center of the front axle.

**SIDE AND INTERSECTION WARNING SWITCH**

The side warning lights shall be controlled through a virtual button on the Vista display and control screen. This button shall be clearly labeled for identification.

**TANK LEVEL LIGHTS**

There shall be two (2) FRC MaxVision surface mount water level light strips.

The light strips shall feature four (4) colors of LED lights to indicate the fluid level of a tank. The colors from top to bottom shall be green, blue, amber, and red.

**TANK LEVEL LIGHTS ACTIVATION**

The tank level lights shall be pre-wired and coiled at rear of the cab for connection to the apparatus by the body builder.

**TANK LEVEL LIGHTS LOCATION**

There shall be water level lights mounted on each side of the cab, centered between the rear cab doors and the rear corners of the cab.

**INTERIOR DOOR OPEN WARNING LIGHTS**

The interior of each door shall include one (1) red 4.00 inch diameter Truck-Lite LED warning light located on the door panel. Each light shall activate with a flashing pattern when the respective door is in the open position to serve as a warning to oncoming traffic.

Each door shall also include one (1) 15.87 inch long X 0.73 inch tall amber Weldon LED warning light. The light shall be located on the upper portion of the door frame to be visible when a person is standing in front of the door while entering or exiting the cab. Each light shall activate with a scrolling directional flash pattern which moves from inside to outside when the door is in the open position. This shall serve as an additional warning to oncoming traffic.

**SIREN CONTROL HEAD**

A Whelen 295HFS2 electronic siren control head with remote amplifier shall be provided and flush mounted in the switch panel with a location specific to the customer’s needs. The siren shall feature 200-watt output, hands free mode and shall be in “standby” mode awaiting instruction. The siren shall offer radio broadcast, public address, wail, yelp, or piercer tones and hands free operation which shall allow the operator to turn the siren on and off from the horn ring if a horn/siren selector switch option is also selected.
STEERING WHEEL HORN BUTTON SELECTOR SWITCH

A virtual button on the Vista display and control screen shall be provided to allow control of either the electric horn or the air horn from the steering wheel horn button. The electric horn shall sound by default when the selector switch is in either position to meet FMCSA requirements.

AUDIBLE WARNING LH FOOT SWITCH

A foot switch wired to actuate the mechanical siren(s) shall be supplied for installation in the front section of the cab for driver actuation.

MECHANICAL SIREN FOOT SWITCH LH

The mechanical siren foot switch shall be a Linemaster model 491-S.

MECHANICAL SIREN FOOT SWITCH LH LOCATION

The mechanical siren foot switch shall be located on the left hand side accessible to the driver between the steering column and the door.

MECHANICAL SIREN FOOT SWITCH LH POSITION

The mechanical siren foot switch shall be positioned outboard of any other foot switch, if applicable.

AUDIBLE WARNING LH FOOT SWITCH BRACKET

A 30.00 degree angled foot switch bracket, wide enough to accommodate (2) foot switches, shall be installed outboard of the steering column for specified driver accessible foot switch activations.

AUDIBLE WARNING RH FOOT SWITCH

A foot switch wired to actuate the mechanical siren(s) shall be supplied for installation in the front section of the cab for officer actuation.

MECHANICAL SIREN FOOT SWITCH RH

The mechanical siren foot switch shall be a Linemaster model 491-S.

MECHANICAL SIREN FOOT SWITCH RH LOCATION

The mechanical siren foot switch shall be temporarily tied up with a coiled wire drop at the firewall inboard for installation by the customer on the right hand side accessible to the officer.

AIR HORN AUXILIARY ACTIVATION

The air horn activation shall be accomplished by two (2) lanyard cables, one (1) on the left hand side accessible to the driver and one (1) on the right hand side accessible to the officer. An air horn activation circuit shall be provided to the chassis harness pump panel harness connector.
MECHANICAL SIREN BRAKE/AUXILIARY ACTIVATION  

Y__ N__

A red momentary siren brake rocker switch shall be provided in the switch panel on the dash.

MECHANICAL SIREN INTERLOCK  

Y__ N__

The siren shall only be active when master warning switch is on to prevent accidental engagement.

BACK-UP ALARM  

Y__ N__

An ECCO model 575 backup alarm shall be installed at the rear of the chassis with an output level of 107 dB. The alarm shall automatically activate when the transmission is placed in reverse.

INSTRUMENTATION  

Y__ N__

An ergonomically designed instrument panel shall be provided. Each gauge shall be backlit with LED lamps. Stepper motor movements shall drive all gauges. The instrumentation system shall be multiplexed and shall receive ABS, engine, and transmission information over the J1939 data bus to reduce redundant sensors and wiring.

A twenty eight (28) icon lightbar message center with integral LCD odometer/trip odometer shall be included. The odometer shall display up to 999,999.9 miles. The trip odometer shall display 9,999.9 miles. The LCD message center screen shall be capable of custom configuration by the users for displaying certain vehicle status and diagnostic functions.

The instrument panel shall contain the following gauges:

One (1) three-movement gauge displaying vehicle speed, fuel level, and Diesel Exhaust Fluid (DEF) level. The primary scale on the speedometer shall read from 0 to 100 MPH, and the secondary scale on the speedometer shall read from 0 to 160 KM/H. The scale on the fuel and DEF level gauges shall read from empty to full as a fraction of full tank capacity. Red indicator lights in the gauge and an audible alarm shall indicate low fuel or low DEF at 1/8th tank level.

One (1) three-movement gauge displaying engine RPM, and primary and secondary air system pressures shall be included. The scale on the tachometer shall read from 0 to 3000 RPM. The scale on the air pressure gauges shall read from 0 to 150 pounds per square inch (PSI) with a red line zone indicating critical levels of air pressure. Red indicator lights in the gauge and an audible alarm shall indicate low air pressure.

One (1) four-movement gauge displaying engine oil pressure, coolant temperature, voltmeter, and transmission temperature shall be included. The scale on the engine oil pressure gauge shall read from 0 to 100 pounds PSI with a red line zone indicating critical levels of oil pressure. A red indicator light in the gauge and audible alarm shall indicate low engine oil pressure. The scale on the coolant temperature gauge shall read from 100 to 250 degrees Fahrenheit (°F) with a red line zone indicating critical coolant temperatures. A red indicator light in the gauge and audible alarm shall indicate high coolant temperature. The scale on the voltmeter shall read from 9 to 18 volts with a red line zone indicating critical levels of battery voltage. A red indicator light in the gauge and an audible alarm shall indicate high or low system voltage. The low voltage alarm shall indicate when the system voltage has dropped below 11.8 volts for more than 120 seconds in accordance with the requirements of NFPA 1901. The scale on the transmission temperature gauge shall read from 100 to 300 degrees °F with a red line zone indicating critical temperatures. A red indicator light in the gauge and an audible alarm shall indicate a high transmission temperature.

The light bar portion of the message center shall include twenty-eight (28) LED backlit indicators. The lightbar shall be split with fourteen (14) indicators on each side of the LCD message screen. The lightbar shall contain the following indicators and produce the following audible alarms when supplied in conjunction with applicable configurations:

RED INDICATORS
Stop Engine - indicates critical engine fault
Air Filter Restricted - indicates excessive engine air intake restriction
Park Brake - indicates parking brake is set
Seat Belt - indicates a seat is occupied and corresponding seat belt remains unfastened
Low Coolant - indicates critically low engine coolant
Cab Tilt Lock - indicates the cab tilt system locks are not engaged.

**AMBER INDICATORS**
Malfunction Indicator Lamp (MIL) - indicates an engine emission control system fault
Check Engine - indicates engine fault
Check Transmission - indicates transmission fault
Anti-Lock Brake System (ABS) - indicates anti-lock brake system fault
High exhaust system temperature – indicates elevated exhaust temperatures
Water in Fuel - indicates presence of water in fuel filter
Wait to Start - indicates active engine air preheat cycle
Windshield Washer Fluid – indicates washer fluid is low
DPF restriction - indicates a restriction of the diesel particulate filter
Regen Inhibit - indicates regeneration of the DPF has been inhibited by the operator
Range Inhibit - indicates a transmission operation is prevented and requested shift request may not occur.
SRS - indicates a problem in the supplemental restraint system
Check Message - indicates a vehicle status or diagnostic message on the LCD display requiring attention.

**GREEN INDICATORS**
Left and Right turn signal indicators
ATC - indicates low wheel traction for automatic traction control equipped vehicles, also indicates mud/snow mode is active for ATC system
High Idle - indicates engine high idle is active.
Cruise Control - indicates cruise control is enabled
OK to Pump - indicates the pump is engaged and conditions have been met for pump operations
Pump Engaged - indicates the pump transmission is currently in pump gear
Auxiliary Brake - indicates secondary braking device is active

**BLUE INDICATORS**
High Beam indicator

**AUDIBLE ALARMS**
Air Filter Restriction
Cab Tilt Lock
Check Engine
Check Transmission
Open Door/Compartment
High Coolant Temperature
High or Low System Voltage
High Transmission Temperature
Low Air Pressure
Low Coolant Level
Low DEF Level
Low Engine Oil Pressure
Low Fuel
Seatbelt Indicator
Stop Engine
Water in Fuel
Extended Left/Right Turn Signal On
ABS System Fault

**BACKLIGHTING COLOR**
Y__ N__
The instrumentation gauges and the switch panel legends shall be backlit using red LED backlighting.

**RADIO**
Y__ N__
A Panasonic radio with weather band, AM/FM stereo receiver, compact disc player, and four (4) speakers shall be installed in the cab. The radio shall be installed above the driver position. The speakers shall be installed inside the cab.
with two (2) speakers recessed overhead in the front portion of the cab rearward of the windshields and two (2) speakers on the upper rear wall of the cab.

**AM/FM ANTENNA**

Y__ N__

A small antenna shall be located on the left hand side of the cab roof for AM/FM and weather band reception.

**CAMERA REAR**

Y__ N__

One (1) Audiovox Voyager heavy duty rearview camera with a teardrop shaped chrome plated housing shall be shipped loose for OEM installation in the body to afford the driver a clear view to the rear of the vehicle. The rear camera display shall activate when the vehicle’s transmission is placed in reverse.

**CAMERA DISPLAY**

Y__ N__

The camera system shall be wired to a 7.00 inch flip down HD monitor which shall include a color display and day and night brightness modes installed above the driver position.

**COMMUNICATION ANTENNA**

Y__ N__

An antenna base, for use with an NMO type antenna, shall be mounted on the left hand front corner of the cab roof so not to interfere with light bars or other roof mounted equipment installed by chassis builder. The antenna base shall be an Antenex model MABVT8 made for either a 0.38 inch or 0.75 inch receiving hole in the antenna and shall include 17 foot of RG58 A/U cable with no connector at the radio end of the cable. The antenna base design provides the most corrosion resistance and best power transfer available from a high temper all brass construction and gold plated contact design. The antenna base shall be chassis builder supplied.

**COMMUNICATION ANTENNA CABLE ROUTING**

Y__ N__

The antenna cable shall be routed from the antenna base mounted on the roof to the area behind and underneath the right hand front seat.

**CAB EXTERIOR PROTECTION**

Y__ N__

The cab face shall have a removable plastic film installed over the painted surfaces to protect the paint finish during transport to the body manufacturer.

**FIRE EXTINGUISHER**

Y__ N__

A 2.50 pound D.O.T approved fire extinguisher with BC rating shall be shipped loose with the cab.

**ROAD SAFETY KIT**

Y__ N__

The cab and chassis shall include one (1) emergency road safety triangle kit.

**DOOR KEYS**

Y__ N__

The cab and chassis shall include a total of four (4) door keys for the manual door locks.
Diagnostic software for the Spartan Advanced Protection System shall be available for free download from the Spartan Chassis website to Spartan authorized OEMs, dealers and service centers, as well as the vehicle owner.

The software has been validated to be compatible with the following RP1210 interface adapters:

- Dearborn Group DPA4 Plus
- Noregon Systems JPRO® DLA+
- Cummins INLINE5
- Cummins INLINE6
- NexIQ™ USB-Link™

The software and adapter utilize the SAE J1939-13 heavy duty nine (9) pin connector which is located below the driver’s side dash to the left of the steering column.

Summary of Warranty Terms:

The following is summary of warranty terms for information only. The actual limited warranty document, which is attached to this option, contains the complete statement of the Spartan Fire Chassis limited warranty. Spartan’s responsibility is to be according to the terms of the complete limited warranty document.

The chassis manufacturer shall provide a limited parts and labor warranty to the original purchaser of the custom built cab and chassis for a period of twenty-four (24) months, or the first 36,000 miles, whichever occurs first. The warranty period shall commence on the date the vehicle is delivered to the first end user.

There shall be two (2) digital copies of the chassis operation manual provided with the chassis. The digital data shall include a parts list specific to the chassis model.

The following manuals specific to the engine and transmission models ordered will be included with the chassis in the ship loose items:

1. Hard copy of the Engine Operation and Maintenance manual with digital copy
2. Digital copy of the Transmission Operator’s manual
3. Digital copy of the Engine Owner’s manual

The cab and chassis shall include two (2) digital copies of wiring schematics and option wiring diagrams.

The sale of the Spartan Chassis shall be governed by the terms contained on the Sales Terms – Acceptance of Purchase Order document, a copy of which is attached to this option.


**DRIVELINE LAYOUT CONFIRMATION**

During the design phase of the chassis the Spartan Chassis driveline engineer shall submit the driveline layout to an OEM engineer to review the chassis design for any potential problems integrating the OEM body to the chassis. The OEM engineer shall provide approval to the driveline engineer prior to driveline bills of materials being released.

### 2.4 TURNING RADIUS

#### Components

- **End User Name**
- **Chassis Model**
- **Wheelbase**
- **Bumper Extension**
- **Bumper Width**
- **Left hand outside tire turn angle**
- **Right hand outside tire turn angle**
- **Left hand Curb-to-Curb turning radius**
- **Right hand Curb-to-Curb turning radius**
- **Left hand Wall-to-Wall turning radius**
- **Right hand Wall-to-Wall turning radius**

#### Measurements

- **Wheelbase**: 222.00 in
- **Bumper Extension**: 21.00 in
- **Bumper Width**: 99.00 in
- **Left hand outside tire turn angle**: 33.50 deg
- **Right hand outside tire turn angle**: 31.00 deg
- **Left hand Curb-to-Curb turning radius**: 32.33 ft, 9.85 m
- **Right hand Curb-to-Curb turning radius**: 34.52 ft, 10.52 m
- **Left hand Wall-to-Wall turning radius**: 37.14 ft, 11.32 m
- **Right hand Wall-to-Wall turning radius**: 39.06 ft, 11.91 m
This drawing is for reference purposes only.
3.00 **BID REQUIREMENTS:** This and all other pages/sections are inclusive in the bid specifications and are agreed upon in the Contract Term Agreement as Contractual Provisions.

3.01 **REQUIRED DOCUMENTS:** Bidders must submit the Contract Term Agreement (Page 1) and the Bid Form (Page 2) from this document. This document is agreed to in full by completion of these two pages. All required bonds, licenses, or certificates of insurance must accompany the participant's bid on submission in addition to any and all documentation requested in the bid specifications. Failure to do so risks immediate rejection of the bid.

3.02 **DEFINITIONS:**

I. The term “County” means Owner and Daviess County, Kentucky and its designated representatives.

II. The term “Vendor” means Supplier, Contractor, Bidder, Participant and Seller and includes designated representatives.

III. The term “Agreement/Contract” means Binding Agreement, Contract, Request for Purchase, Order.

3.03 **KENTUCKY OPEN RECORDS LAW:** At the time a bid or proposal is submitted to the County, the Vendor shall identify any information that is submitted as a part of the bid that is proprietary or confidential in nature and not subject to release for public inspection. The County will protect any proprietary or confidential information to the extent allowable under the Kentucky Open Records Act.

3.04 **NEW GOODS, FRESH STOCK:** Where applicable and unless otherwise specified, all contractors shall provide new commodities, fresh stock, latest model, design or package.

3.05 **METHOD OF AWARD:** This bid will be evaluated on the evaluation criteria established in the bid specification and awarded based on the best evaluated bid.

The County reserves the right to reject any and all bids or parts thereof, and to waive any irregularities in said bids. The right is reserved to award bids based on the best interest and/or what is most advantageous to the County. The County also reserves the right to consider as a part of the bid evaluation the stated warranty, stated delivery schedule and payment terms. Award will be made, according to the opinion of the Daviess County Fiscal Court, to the best evaluated bid.

3.06 **CERTIFICATION OF INDEPENDENT PRICE DETERMINATION**

I. The Prices in the bid shall be independently determined, without consultation, communication, or agreement for the purpose of restricting competition as to any matter relating to price with any Bidder or other person.

II. Unless otherwise required by law, the prices shall not have been knowingly disclosed by the Bidder prior to opening.

III. No attempt has been made or will be made by the Bidder to induce any other person or firm to submit or not to submit a bid.

3.07 **LANGUAGE:** Bids and all related documents will only be accepted in the English Language.

3.08 **PRICE:** All prices shall be quoted exclusive of any taxes. The Daviess County Fiscal Court is exempt from Federal Excise Tax and/or Kentucky Sales Tax. Any items supplied directly to Daviess County Fiscal Court from a supplier/manufacturer are exempt from sales tax. Any items purchased by a contractor that will be used in the fulfillment of a contract are not exempt from sales and use tax.

**Note 1:** In case of a discrepancy in the extension of a unit price, the unit price shall govern the total price.

**Note 2:** Bidders must provide manufacturer's product literature (if available) and appropriate with the bid submission.

**Note 3:** Prices quoted shall remain firm and open to acceptance by the County for a minimum period of sixty (60) days after bid opening.

3.09 **SHIPPING CHARGES:** All items quoted shall be “F.O.B. Destination”. No additional freight charges will be allowed.
3.10 BID SUBMISSION INFORMATION:

Separate sealed bids shall be received by the Daviess County Fiscal Court, P. O. Box 1716, Owensboro, KY 42302-1716.

SAMPLE ENVELOPE

<table>
<thead>
<tr>
<th>Vendor Name</th>
<th>Vendor Address</th>
<th>Contact Number</th>
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<tbody>
<tr>
<td></td>
<td>Attn: Purchasing Department</td>
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<td></td>
<td>Daviess County Fiscal Court</td>
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<td></td>
<td>PO Box 1716</td>
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<td></td>
<td>Owensboro, KY 42302-1716</td>
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</table>

SEALED BID: (Bid Name)

Bids must be received by the date and time specified on page 1 of this document. Any bids received after that date and time will not be accepted. Specifications are on file at the Daviess County Judge Executive’s Office at 212 St. Ann Street, Room 202, Owensboro, KY 42303, or by calling 270-685-8424.

3.11 BID OPENINGS: Bids will be publicly opened and read aloud at the time indicated on page 1. The Bidders and the public are invited but not required to attend the formal opening of the bids. No decisions relating to the award of a contract or agreement will be made at the opening.

3.12 DELIVERY: Deliveries shall be made in strict accordance with any delivery schedule or instructions contained in the bid specifications and in the exact quantity ordered. Failure to adhere to delivery schedule is reason for termination in accordance with the Contract Termination clause. If the Contract includes multiple locations for delivery, deliveries are to be made to the locations specified by the County at the time of order.

3.13 INSPECTION, ACCEPTANCE AND APPROVALS: Goods at all times and places, including the period of manufacture, are subject to inspection and test by the County. The County will accept or give notice of rejection of goods delivered within a reasonable time after receipt. Acceptance shall not waive any warranty. All goods supplied are subject to final inspection and acceptance by County notwithstanding payment, prior inspections or approvals. County may require prompt replacement or correction of rejected goods at Supplier’s expense, including a reduction in price for rejected goods. Supplier shall not resubmit rejected goods to County without prior written approval and instructions from the County. In addition, Supplier shall identify resubmitted goods as previously rejected. Supplier shall provide and maintain a quality assurance and control system acceptable to the County.

3.14 WARRANTY: Unless otherwise agreed to in writing by the parties, the Supplier warrants that items ordered to specifications will conform thereto and to any drawings, samples or other descriptions furnished or adopted by the County. If the items were not ordered to specifications, the Supplier warrants they will be fit and sufficient for the purpose intended, and that all items will be new, merchantable, of good material and workmanship, and free from defect. Such warranties, together with Supplier’s service warranties and guarantees, if any, shall survive inspection, test, acceptance of, and payment for the items and shall run to the County and its assigns. Except for latent defects, the County shall give notice of any nonconformity to the Supplier within one (1) year after acceptance. The County may return for credit or require prompt correction or replacement of the defective or non-conforming goods or have the defective good corrected or replaced at the Supplier’s expense. Return to the Supplier of any defective or non-conforming goods and delivery to the County of any corrected or replaced goods shall be at the Supplier’s expense. Defective or non-conforming items shall not be corrected or replaced without written authorization by the County. Goods required to be corrected or replaced shall be subject to the provisions of this clause and the clause heretoentitled “Inspection, Acceptance, and Approvals” in the same manner and to the same extent as goods originally delivered under this contract.

3.15 CHANGE ORDER: The County may make changes within the general scope of this contract. If any such changes cause an increase or decrease in the cost of or the time required for the performance of any part of the work, whether changed or not changed by any such order, an equitable adjustment shall be made in the price or delivery schedule or both, and any change order shall be in writing. Any claim by a Supplier for adjustment under this clause shall be asserted within fifteen (15) days from the date of receipt of this written order directing the
change, provided, however, the County, if it decides that the facts justify such action, may receive and act upon such claim asserted at any time prior to final payment.

3.16 **PAYMENT:** Payment will be made to the Supplier within 30 days or less after delivery of goods or services and submission of certified invoices. Price is tax-exempt. Unless further detailed in the bid specifications, or unless the Contract is for multiple purchases over a given period, a single payment will be issued in the amount of the Total Bid Price.

3.17 **SELLER’S INVOICES:** Invoices shall contain the following information: Bid Number, Purchase Order Number (if supplied), Contract description of goods or services, sizes, quantities, unit prices and extended totals.

3.18 **COMPLIANCE WITH APPLICABLE LAWS:** Supplier warrants it has complied with all applicable laws, rules and ordinances of the United States, Kentucky or any other Governmental authority or agency in the manufacture or sale of the goods or services.

3.19 **CHOICE OF LAW:** This bid and Contract shall be governed and interpreted according to the laws of the State of Kentucky. Venue for any court action shall be in Daviess County, Kentucky.

3.20 **BID DEPOSITS / BONDS:** Bid deposits / bonds are not required unless specified in the bid specifications section of this document. If required, bid deposits / bonds must be in the exact amount as stipulated.

3.21 **PERMITS AND CODES:** Unless otherwise set out in the specifications or required by the agencies involved, the Contractor shall make application for, obtain and pay for all licenses and permits necessary for the prosecution of the Work and shall pay for all fees and charges in connection therewith. The Contractor shall be required to comply with all state or municipal ordinances, laws, and/or codes in so far as the same are binding on the Owner.

3.22 **CONTRACT TERMINATION:**

I. **General:** Performance of work may be terminated by the County in whole, or from time to time in part, whenever the County shall determine that such termination is in the best interest of the County with a thirty (30) day written notice. The Vendor may only terminate the Contract with consent of the County in writing, and must give the County a sixty (60) day written notice to request termination of the Contract. In the event of any termination of the Agreement/Contract by the Vendor, the County may purchase such supplies and/or services similar to those terminated and for the duration of the Agreement/Contract period the Vendor will be liable for all costs in excess of the established contract pricing.

II. **Bankruptcy or Insolvency:** In the event bankruptcy proceedings are commenced by or against Supplier or under any provisions of the United States Bankruptcy Act or for the appointment of a receiver or trustee or a general assignment for the benefit of creditors of either party, the County shall be entitled to terminate without further cost or liability. The County may cancel the Agreement/Contract or affirm the Contract and hold the Vendor responsible for damages.

III. **Default:** The County may terminate the whole Contract or any part in either of the following circumstances:

   A. If Supplier fails to deliver the items required by the contract within the time specified; or

   B. If Supplier fails to perform any of the other provisions of the Contract, or so fails to make progress as to endanger performance of the contract in accordance with its terms. In the event of termination under subparagraph B, the County shall have the right to procure, on such terms and in such manner as it may deem appropriate, items similar to those terminated, and to recover from Supplier the excess cost for such similar items provided, however, Supplier shall not be liable for such excess costs where the failure upon which the termination is based has arisen out of causes beyond the control of Supplier and without the fault or negligence of Supplier. Such causes shall be deemed to include fires, floods, earthquakes, strikes, and acts of the public enemy. The rights of the County provided in subparagraph B shall be in addition to any other rights provided by law or the Contract.

   C. In the event of the Supplier’s non-compliance with the provisions as set forth, this Contract may be cancelled, terminated or suspended in whole or in part and the Supplier may be declared ineligible for further County contracts. The rights and remedies of the County provided in this paragraph shall not be exclusive but are in addition to any remedies provided in this Contract or as provided for by law.
3.23 **RENEWAL OPTION:** The County reserves the right to extend the awarded contract for one (1) additional one-year term with the written consent of the awarded Vendor for up to a maximum of four (4) consecutive extensions.

3.24 **NON-EXCLUSIVE AGREEMENT:** The Contractor shall understand and agree that the Contract shall not be construed as an exclusive agreement and further agrees that the County may secure identical and/or similar services or projects from other sources at any time in conjunction with or in replacement of the Contractor’s services.

3.25 **BUSINESS LICENSE:** Where applicable, the Contractor must have a valid City of Owensboro or Daviess County Fiscal Court business license for the prosecution of work. The Contractor must provide proof of this license to the County either by attachment to bid submission or post award (for applicable Contracts). The Contractor must pay any Occupational Tax / Net Profit Tax resulting from business activity within Daviess County.

3.26 **INSURANCE REQUIREMENTS:** Where applicable, the Vendor/Contractor shall purchase and maintain insurance with an insurance company licensed to do business in the State of Kentucky or in the state where the Vendor is incorporated or otherwise licensed to do business and which shall remain, at all times during the term of any contract with the County, in full force and effect. Preference will be given to a Vendor/Contractor who provides insurance with an insurance company licensed to do business in the State of Kentucky, but in any event said Vendor/Contractor shall provide said insurance at its own expense. Such insurance shall be provided and will protect the Vendor/Contractor from claims which may arise out of or result from the Vendor/Contractor’s execution of the work, whether such execution be by himself, his employees, agents, or by anyone for whose acts any of them may be liable. If any such work covered by the Contractor is to be performed on County owned or leased premises, the Vendor agrees to carry liability and workman’s compensation insurance, satisfactory to the County, and to indemnify the County against all liability, loss, and damage arising out of any injuries to persons and property caused by the Vendor, his sub-contractors, employees or agents. The insurance coverage shall be such as to fully protect the County and the general public from any and all claims for injury and damage resulting by any actions on the part of the Vendor/Contractor or its forces as enumerated above. All policies must name the County as an additional insured. Any disputes regarding a breach, insurance amounts, liability, coverage, lapse or otherwise shall be litigated in the Circuit Court of Daviess County, Kentucky and the same shall be incorporated into any Contract agreed to by the parties.

WHERE APPLICABLE, THE COUNTY REQUIRES A CURRENT AND VALID CERTIFICATE OF INSURANCE OR Binder showing required insurance coverage be provided with each bid. Daviess County must be added as an additional insured after award of the bid. Any lapse in insurance coverage or cancellation thereof by the Contractor or sub-contractors during the terms of the contract shall immediately be deemed a material breach under the terms of any contract.

I. **Comprehensive General Liability Insurance**

The Vendor/Contractor shall maintain and keep in full force and effect during the terms of this Contract such comprehensive general liability insurance as shall protect them from claims which may arise from operations under this Contract, whether such operations be by themselves or by anyone directly or indirectly employed by them. The amounts of this insurance shall not be less than:

- $1,000,000 Each Occurrence Limit
- $1,000,000 Personal & Advertising Injury Limit
- $1,000,000 Products – Completed Operations Aggregate Limit
- $1,000,000 General Aggregate Limit (Other than Products-Completed Operations)

II. **Workers Compensation Insurance**

The Vendor/Contractor or his sub-contractor or contractors shall maintain and keep in force of this Contract such Workers Compensation insurance limits as required by the statutes of the State of Kentucky and Employer’s Liability with limits no less than the Kentucky Workers Compensation statutory limits.

III. **Professional Liability Insurance**

Where applicable, the Vendor/Contractor shall provide the County with proof of Professional Liability Insurance, which shall protect the County against any and all claims which might arise as a result of the operation of the
Vendor/Contractor in fulfilling the terms of this Contract during the life of the Contract. The minimum amounts of such insurance will be $1,000,000. Should any work be subcontracted, these limits will also apply.

3.27 ALTERNATE & EQUIVALENT BIDS: It is not the intention of the specifications within this document to eliminate any bidder; however, quoted items must equal or exceed stated specifications. Sufficient documentation is required to verify equivalent or superior performance.