

# ST. LOUIS FIRE DEPARTMENT PUMPER SPECIFICATIONS

**The following are specifications for the furnishing of three (3) Pumper Fire Apparatus and miscellaneous equipment. The specifications are based on our current pumper, chassis and body configurations. The use of these specifications is intended to procure a product with comparable performance in terms of operation, usable space, durability and reliability.**

## **BRAND NAMES**

**If and whenever brand names, makes, names of manufacturers, trade names, bidder catalogs or model numbers and dimensions are stated, they are for the purpose of establishing a grade or quality of material and manufacturing methods. The City/St. Louis Fire Department may accept any approved equal as defined in the paragraph above.**

**The City/St. Louis Fire Department shall be the sole judge concerning the merits of the grade or quality of product specified based on the supporting documentation furnished with the bid.**

## **NFPA 1901-2016**

The National Fire Protection Association "Standard for Automotive Fire Apparatus", 2016 edition, is hereby adopted and made a part of these specifications, the same as if it were written out in full detail, with the exception of the section dealing with "Equipment Recommended for Various Types of Apparatus". Bidders shall provide the equipment requested herein and the buyer shall supply the rest before the apparatus is put into service. It is the intent of the purchaser to purchase an apparatus that meets 100% of the minimum standards defined and outlined in NFPA 1901-2016 edition. There are to be no exceptions to this requirement.

## **CONSTRUCTION DOCUMENTATION**

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

1. The manufacturers record of apparatus construction details, including the following information:

- Owners name and address
- Apparatus manufacturer, model, and serial number
- Chassis make, model, and serial number
- GAWR of front and rear axles
- Front tire size and total rated capacity in pounds or kilograms
- Rear tire size and total rated capacity in pounds or kilograms
- Chassis weight distribution in pounds with water and manufacturer mounted equipment (front and rear)
- Engine make, model, serial number, rated horsepower and related speed, and governed speed
- Type of fuel and fuel tank capacity
- Electrical system voltage and alternator output in amps

- Battery make, model, and capacity in cold cranking amps (CCA)
- Chassis transmission make, model, and serial number; and if so equipped, chassis transmission PTO(s) make, model, and gear ratio
- If applicable, the pump make, model, rated capacity in gallons or liters per minute, and serial number
- Pump transmission make, model, serial number, and gear ratio, if unit is equipped with a pump
- If applicable, the auxiliary pump make, model, rated capacity in gallons or liters per minute, and serial number
- Water tank certified capacity in gallons or liters
- Paint manufacturer and paint number(s)
- Company name and signature of responsible company representative

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

3. For the fire pump, a copy of the following shall be provided: pump manufacturers certification of suction capability, apparatus manufacturer's approval for stationary pumping applications, engine manufacturers certified brake horsepower curve showing the maximum governed speed, pump manufacturers certification of the hydrostatic test, and the certification of inspection and test for the fire pump

4. For the fixed line voltage power source, the certification of the test for the fixed power source

5. Weight documents from a certified scale showing actual loading on the front axle, rear axle(s), and overall fire apparatus (with the water tank full but without personnel, equipment, and hose)

6. Written load analysis and results of the electrical system performance tests

7. A certification of water tank capacity

### **OPERATION AND SERVICE DOCUMENTATION**

All documentation provided shall be placed on a USB drive which shall be provided at time of delivery, unless otherwise stated within this document. Two additional copies of the USB will also be provided.

The contractor shall supply, at time of delivery, at least two (2) sets of complete operation and service documentation covering the completed apparatus as delivered and accepted. The documentation shall address at least the inspection, service, and operations of the fire apparatus and all major components thereof. The contractor shall also provide documentation of the following items for the entire apparatus and each major operating system or major component of the apparatus:

1. Manufacturers name and address
2. Country of manufacturer
3. Source of service and technical information
4. Parts and replacement information
5. Descriptions, specifications, and ratings of the chassis, pump, and aerial device
6. Wiring diagrams for low voltage and line voltage systems to include the following information: representations of circuit logic for all electrical components and wiring, circuit identification, connector pin identification, zone location

of electrical components, safety interlocks, alternator-battery power distribution circuits, and input/output assignment sheets or equivalent circuit logic implemented in multiplexing systems

7. Lubrication charts
8. Operating instructions for the chassis, any major components such as a pump or aerial device, and any auxiliary systems
9. Precautions related to multiple configurations of aerial devices, if applicable
10. Instructions regarding the frequency and procedure for recommended maintenance
11. Overall apparatus operating instructions
12. Safety considerations
13. Limitations of use
14. Inspection procedures
15. Recommended service procedures
16. Troubleshooting guide
17. Apparatus body, chassis, and other component manufacturers warranties
18. Special data required by this standard
19. Copies of required manufacturer test data or reports, manufacturer certifications, and independent third-party certifications of test results
20. A safety data sheet (SDS) for any fluid that is specified for use on the apparatus

The contractor shall deliver with the apparatus all manufacturers operations and service documents supplied with components and equipment that are installed or supplied by the contractor.

### **INTENT OF SPECIFICATIONS**

It is the intent of these specifications to cover the furnishing and delivery to the purchaser of a complete apparatus equipped as herein specified. With a view to obtaining the best results and the most acceptable apparatus for service in the fire department, these specifications cover the general requirements as to the type of construction, together with certain details as to finish, equipment, and appliances with which the successful bidder must 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 of all features.

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

Each bidder shall furnish satisfactory evidence of his ability to construct the apparatus specified, and shall state the location of the factory where the apparatus is to be built. The bidder shall also show that they are in a position to render prompt service and furnish replacement parts for said apparatus.

### **CONTRACTOR'S SPECIFICATIONS**

Each bid shall be accompanied by a set of "Contractor's Specifications" consisting of a detailed description of the apparatus and equipment proposed and to which the apparatus furnished under contract must conform.

These specifications shall indicate size, type, model, and make of all component parts and equipment.

## **PERFORMANCE BOND AND PAYMENT BOND– 100%**

The bidder shall provide, within thirty (30) days after award of contract, and along with a signed copy of the contract, a performance bond, which guarantees performance of all terms and conditions of the contract and of the Basic One (1) Year Limited Warranty agreement, and a payment bond, which will guarantee payment for labor, materials, and equipment furnished for use in the performance of the contract. The performance bond will specifically cover the performance of the contract according to its terms and conditions. The payment bond will cover payment of labor, materials, and equipment furnished for use in the performance of the contract. This performance bond and payment bond will be issued by a surety company who is listed by the U.S. Treasury Department's list of approved sureties, as published in Circular 570, as of the bid date.

The performance bond and payment bond will be issued in an amount equal to 100% of the contract amount and will be dated concurrent to, or subsequent to, the date of the contract.

## **BID BOND – 10%**

A bid bond as security for the bid in the form of a 10% bid bond will be provided with the proposal. This bid bond will be issued by a Surety Company who is listed on the U.S.

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

## **TIMELY PROPOSALS**

It is the bidder's responsibility to see that their proposals arrive on time. Late proposals, facsimiles, e-mails, telegram, or telephone bids shall not be considered.

## **THREE COPIES OF BID PROPOSAL**

An original and two copies of the bid proposal shall be submitted.

## **DRAWINGS**

All bid drawings shall be stamped PROPOSAL.

- A total of six (6) packets of 11" x 17" drawings, each packet complete with a single view drawing for each side of the apparatus shall be supplied
- All drawings shall be drawn and printed to an appropriate scale to maximize the size of the apparatus on each 11" x 17" sheet of paper.
- Compartment door opening dimensions shall be shown in each compartment.
- Drawings shall be five (5) views. (left, right, front, rear, top) with the exception of chassis that are not always available as AutoCAD drawings
- Rear plumbing, such as 2-1/2" discharges, rear steamers, and direct tank fills, shall be shown
- Ladders shall be labeled with a letter designation referring to the table for an explanation of the ladder type
- OAL (overall length) in feet & inches -

Estimated length shall be rounded up to the nearest inch

- OAH (overall height) in feet & inches

Estimated height shall be rounded up to the nearest inch

- Body dimensions shown - pump house width & front of the body to centerline of the rear axle
- Wheelbase in inches
- Estimated in-service weight
- Turning clearance radius
- Front and rear overhang in inches
- No pump panel or instrument panel controls, discharges or inlets. To be blank and labeled "Pump Panel"
- Water tank outline
- Foam tank(s) fill towers
- Exterior mounted hard suction hose
- Warning lights
- D.O.T. lights
- Generator outline
- Front bumper layout
- Rollup doors will be shown in open position. Lap doors will be shown in the closed position
- Compartment depth break over measurement. The measurement where the compartment switches from full depth to shallow depth
- Angle of approach and departure
- Top view of chassis

#### Text Block Items

- Chassis model
- Water tank capacity
- Foam tank capacity
- Hose bed capacity in cubic feet
- Total compartment cubic feet
- Drawing box is to read "BID" and utilize the bid number
- Drawings shall be printed on white paper with black ink; blue line drawings shall not be acceptable.

**Will furnish section as written: Yes \_\_\_NO\_\_\_Exception #\_\_\_\_\_**

#### **BID FORMS / SPECIFICATIONS**

All bid forms shall be submitted on the attached bid form. The bid form and/or these specifications shall be filled out by checking either the "YES" or "NO" checkbox for each and every section/paragraph. Failure to use this form and/or these specifications shall be cause for immediate rejection of any bid.

**STATEMENT OF EXCEPTIONS**

The proposed apparatus as described in this specification document and all related material with the bid package shall meet or exceed all applicable sections for the category of apparatus as defined by NFPA 1901, unless specifically noted within this specification or other official documents associated with this bid.

Should any area, section or portion of the apparatus not meet the intent and applicable requirements, a clearly defined listing or explanation of what and why compliance was not achieved shall be provided to the purchaser at the time of delivery.

**EXCEPTION TO SPECIFICATIONS**

The following chassis, pump, and body specifications shall be strictly adhered to. Exceptions shall be allowed if they are equal to or superior to that specified (as judged by the customer), and provided they are listed and fully explained on a separate page entitled "EXCEPTIONS TO SPECIFICATIONS". Exception lists shall refer to the specification page number. Each check in the "NO" column shall be listed and fully explained. Where no check is made in a particular paragraph either "YES" or "NO", it shall be assumed the bidder is taking exception to that paragraph. If a paragraph contains an empty column, where the bidder neglected to check the proper "YES" or "NO" column, it is assumed the bidder is not conforming to the requirements of this paragraph. If no explanation is given in the "EXCEPTIONS TO SPECIFICATIONS" document, the bid is subject to immediate rejection

**PROPOSALS TAKING TOTAL EXCEPTION TO THESE SPECIFICATIONS WILL BE IMMEDIATELY REJECTED.**

The buyer is aware that all bidders shall have to take some exceptions therefore; BIDDERS THAT TAKE NO EXCEPTIONS shall BE REQUIRED TO MEET EVERY PARAGRAPH TO THE FULLEST EXTENT SHOULD THEIR BID BE ACCEPTED.

Upon delivery, the apparatus shall be inspected against THESE specifications and not those supplied by the bidder with their proposal. Deviations shall not be acceptable unless they were noted as exceptions at the time of bid and the apparatus shall be rejected until said deviations are corrected to the satisfaction of the buyer.

Decisions regarding equal to or better than, shall be the sole responsibility of the St. Louis Fire Department and its representatives, rather than those companies submitting bids. All deviations, regardless of significance must be explained in the "EXCEPTIONS TO SPECIFICATIONS" section of the bid.

When exceptions are not taken but inconsistencies are noted in the submitted detailed specifications, the bid may be subject to rejection.

**Will furnish section as written: Yes \_\_\_NO\_\_\_Exception #\_\_\_\_\_**

**PURCHASER'S OBLIGATIONS**

The purchaser reserves the right to accept or reject any or all bids on such basis as the purchaser deems to be in its best interest. All bidders shall be advised that the purchaser is not bound in any manner to automatically accept the lowest bid. The purchaser shall only be obligated to purchase the lowest bid that meets these detailed specifications as closely as they deem meet the desired purpose of this bid.

**SAFETY REQUIREMENTS**

It is required that the bidder shall meet all State and Federal safety standards and laws that are in effect on the date of the bid for the item(s) that are being specified and the particular use for which they are meant.

**Will furnish section as written: Yes \_\_\_NO\_\_\_Exception #\_\_\_\_\_**

## **ACQUAINTANCE WITH SPECIFICATIONS**

It is the responsibility of the bidder to review all of the bidding requirements. Failure of a bidder to be acquainted with this information shall not relieve them from any obligations of the bid requirements.

## **QUALITY AND WORKMANSHIP**

The design of the apparatus shall embody the latest approved automotive engineering practices. Experimental designs and methods shall not be acceptable.

The workmanship shall be of the highest quality in its respective field. Special consideration shall be given to the following points: accessibility of the various units that 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.

## **GENERAL CONSTRUCTION**

The complete apparatus, assemblies, subassemblies, component parts, and so on, shall be designed and constructed with due consideration to the nature and distribution of the load to be sustained and to the general character of the service to which the apparatus is to be subjected when placed in service.

All parts of the apparatus shall be strong enough to withstand the general service under full load. The apparatus shall be so designed that the various parts are readily accessible for lubrication, inspection, adjustment and repair.

The apparatus shall be designed and constructed, and the equipment so mounted, with due consideration to distribution of the load between the front and rear axles, and side to side loading that all specified equipment, including a full complement of specified ground ladders, full water tank, loose equipment, and firefighters; shall be carried without overloading or damaging the apparatus as per requirements defined in NFPA 1901.

The main apparatus body structure shall have an approximate width of 100" in order to maximize the enclosed compartment space of the apparatus. The 100" wide measurement represents the main body structure measured from the bottom, outermost rear corners of the apparatus body structure. Components affixed or fastened to the apparatus will increase the body width proportionately.

## **LIABILITY**

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

## **WARRANTY**

A copy of the warranties for the chassis, pump, body, paint, and water tank shall be furnished with each bidder's proposal.

## **INFORMATION REQUIRED UPON DELIVERY**

The manufacturer shall supply at the time of delivery at least three copies of a complete operation and maintenance manual covering the completed aerial device as delivered. Provided on USB.

Parts manuals, where possible, shall be cross referenced so as to show the actual manufacturer's name, part number and description on all outside purchased parts and fittings that are commercially available.

## **ADDITIONAL TRAINING REQUIRED UPON DELIVERY**

The authorized apparatus manufacturer's instructor shall provide basic apparatus technical/maintenance training within second week after acceptance of unit; Training shall cover but is not limited to the following major components such as:

- Engine and emission controls
- Transmission and retard system
- V-Mux electronics
- Pumping troubleshooting
- Electrical system
- APU troubleshooting and care

**Will furnish section as written: Yes \_\_\_ NO \_\_\_ Exception # \_\_\_\_\_**

**ROADABILITY**

The apparatus, when fully equipped and loaded, shall be capable of the following performance while on dry paved roads that are in good condition:

- From a standing start, the apparatus shall be able to attain a speed of 35 mph (55 kmph) within 25 seconds on a level road.
- The apparatus shall be able to attain a minimum top speed of 50 mph (80 kmph) on a level road.
- The apparatus shall be able to maintain a speed of at least 20 mph (30 kmph) on any grade up to and including 6 percent.

The maximum top speed of the apparatus shall not exceed the tire manufacturer's maximum speed rating for the tires installed on the apparatus.

**FAILURE TO MEET TESTS**

In the event the apparatus fails to meet the test requirements of these specifications on the first trials, second trials may be made at the option of the bidder within 30 days of the date of the first trials.

Such trials shall be final and conclusive and failure to comply with these requirements shall be cause for rejection. Failure to comply with changes as required to conform to any clause of the specifications within 30 days after notice is given to the bidder of such changes, shall be cause for rejection of the apparatus.

Permission to keep or store the apparatus in any building owned or occupied by the Department during the specified period, with the permission of the bidder, shall not constitute acceptance. No Exceptions

**PROPOSAL SEQUENCE**

Bid specifications shall be submitted in the same sequence as these specifications for ease of checking compliance. There shall be no exceptions allowed to this requirement. The apparatus committee intends to be thorough during the evaluation of bids process. In order to maximize efficiency and minimize the time it takes to thoroughly evaluate all received bids this requirement must be strictly adhered to.

**AWARD OF CONTRACT**

All bids submitted shall be good for a minimum of 30 days during which time bid securities submitted with the proposals shall be held by the purchaser. Criteria for the award shall include, but not be limited to, the following:

- Apparatus Performance And Safety Levels / Considerations
- Completeness of proposal
- Accuracy of accompanying data
- Past performance of bidder
- Compliance with the detailed specifications
- Compliance with purchasers request(s) for personnel qualifications or certifications
- Exceptions and clarifications
- Financial stability of bidder
- Local representation of the manufacturer
- Serviceability of the proposed apparatus
- Service capabilities of the bidder's local representative
- Compliance with NFPA 1901
- Any other factor the purchaser deems relevant

#### **OVERALL HEIGHT**

The actual overall height of the vehicle shall be approximately 119" from the ground. This measurement shall be taken with the tires properly inflated with the apparatus in the unloaded condition. The actual measurement shall be taken at the highest point of the apparatus.

#### **OVERALL LENGTH**

The actual overall length of the vehicle shall be approximately 410".

#### **WHEELBASE**

The actual wheelbase of the vehicle shall be approximately 211".

#### **ANGLE OF APPROACH**

The actual angle of approach of the vehicle shall be a minimum of 10 degrees.

#### **ANGLE OF A DEPARTURE**

The actual angle of departure of the vehicle shall be a minimum of 10 degrees.

#### **VEHICLE TOP SPEED**

The apparatus Gross Vehicle Weight Rating (GVWR) is over 26,000 lbs. The vehicle's top speed shall be 68 mph.

#### **MISCELLANEOUS EQUIPMENT ALLOWANCE**

The Gross Axle Weight Rating (GAWR) and the Gross Combined Weight Rating (GCWR) or Gross Vehicle Weight Rating (GVWR) of the chassis shall be adequate to carry the weight of the unequipped apparatus with the water tank and other tanks full, specified hose load, unequipped personnel weight, ground ladders, and miscellaneous equipment allowance of 2,000 pounds.

## **MISCELLANEOUS EQUIPMENT**

Miscellaneous equipment shall be included in this bid in an addendum titled Miscellaneous Equipment. It will be the responsibility of all bidders to supply the equipment as indicated in this document. All apparatus will be delivered with all tools mounted in the locations as indicated. Exceptions or substitutions to the equipment list or locations will follow the same guidelines as indicated for the apparatus.

## **OWNER'S MANUAL**

There shall be an owner's manual containing the construction, operation, and service documentation provided on a USB Drive. There shall be three (3) copies of the USB provided with the apparatus.

## **ELECTRICAL MANUAL**

A complete electrical manual for the apparatus shall also be provided on the USB Drive. This manual shall be specifically prepared for this individual unit rather than a generic schematic manual designed to accommodate all apparatus. The electrical manual shall also include electrical schematics, harness layouts, V-Mux specifications (including Node Input/output Spreadsheet and Node Relationship Spreadsheet), and Master Wire Listing. A contact letter shall also be provided by the electrical engineer, who built the manual, with instructions on using the manual and contact information for assistance with electrical manual questions.

### **ELECTRICAL SCHEMATICS**

There shall be a section of the electrical manual that shall include schematics of the electrical system and components on the apparatus. These schematics shall be specifically prepared for this individual unit rather than a generic schematic designed to accommodate all apparatus.

### **PUMP PLUMBING SCHEMATICS**

There shall be a section of the electrical manual that shall include a schematic of the pump plumbing. This schematic shall be specifically prepared for this individual unit rather than a generic schematic designed to accommodate all apparatus.

### **HYDRAULIC SCHEMATICS**

There shall be a section of the manual that shall include schematics of the hydraulic components on the apparatus including but not limited to:

- Ergonomic Hose Load

## **PRE-CONSTRUCTION MEETING**

There shall be a pre-construction meeting required and shall be held at the OEM factory. The pre-construction meeting is the most important meeting during the after-sale production process. The purpose of this meeting is to finalize all aspects of the specifications, discuss and clarify all design details of the apparatus and to share or provide all information so all parties are in agreement on the apparatus being constructed. The ultimate goal of the pre-construction meeting is for the purchaser and dealer representative(s) to discuss and clarify all aspects of the proposed apparatus and to provide all necessary information to the apparatus manufacturer that shall ensure the apparatus is built to the satisfaction of all parties involved.

The apparatus manufacturer shall create and forward to the dealer a "Pre-construction" document containing the following items:

- Complete specifications of the apparatus including the chassis

- Detailed amp draw report
- Listing of clarifications or questions from the manufacturer that require attention (shelf locations, lettering details, etc.)
- A total of six (6) packets of 11" x 17" drawings, each packet complete with a single view drawing for each side of the apparatus shall be supplied
- All drawings shall be drawn and printed to an appropriate scale to maximize the size of the apparatus on each 11" x 17" sheet of paper.

During this pre-construction meeting, any changes or clarifications must be documented on a manufacturer issued change order. The change order shall be signed by the customer and dealership and ultimately by the apparatus manufacturer. The change order becomes an extension of the contract with the official signatures of all three parties. All change order items resulting from the pre-construction meeting shall be implemented into the official shop order document.

**All expenses for four (4) fire department personnel and one (1) equipment services representative to attend this meeting shall be included in the bid proposal.**

### **PRE-PAINT INSPECTION**

There shall be an inspection of the apparatus at the pre-paint stage of production by the customer at the apparatus manufacturer's showroom. The customer shall be given the opportunity to visually inspect the chassis, pump panel, plumbing, and all other body options so that any discrepancies may be addressed prior to the painting process. A company representative shall be present at the inspection to answer all questions. Adequate notice shall be given to the dealer as to when the apparatus will be available for inspection.

**All expenses for four (4) fire department personnel and one (1) equipment services representative to attend this inspection shall be included in the bid proposal.**

### **FINAL INSPECTION**

The customer and/or dealer representative will inspect the final apparatus prior to it leaving the apparatus body manufacturer's facility. This will allow any changes that may be required, to be done so in a timely and inexpensive manner. After leaving the facility, all repairs or alterations will be performed by either the Dealer or an OEM approved service center.

**All expenses for four (4) fire department personnel and one (1) equipment services representative to attend this inspection shall be included in the bid proposal.**

### **INSPECTION CERTIFICATE - NFPA 1901 COMPLIANCE**

A third party inspection certificate for the apparatus shall be furnished upon delivery. The purpose of this NFPA 1901 compliance inspection shall be to serve as proof to the customer that all applicable standards have been met or exceeded by the responsible manufacturer.

The following objectives shall be achieved as a result (this listing shall not be construed as being all inclusive):

- Ensure that understanding of all parties respective responsibilities have been addressed by the actual referencing of NFPA 1901 and the amendments in these specifications and the purchase contract and documentation.
- Ensure that only structural materials complying with appropriate standards and codes are used for construction.
- Ensure that applicable standards of design and manufacturing have been met or exceeded.

- Ensure that safety factors have been met or exceeded where required.
- Ensure that applicable standards for testing and inspection have been met or exceeded by personnel with the appropriate qualifications, experience, and certifications.
- Ensure that where applicable components, equipment, and loose equipment carry the appropriate characteristics, classifications, and/or certifications.
- Ensure that in general and as a whole, all applicable requirements set forth in NFPA 1901, and those codes, standards, and specifications referenced by said parties are met, exceeded, and/or addressed.

**INDEPENDENT THIRD PARTY PUMP CERTIFICATION**

The fire pump shall be tested and certified by Underwriter's Laboratories, a nationally recognized independent third party testing company. Tests shall be conducted so that the pump performs as listed below:

- 100% of rated capacity at 150 pounds net pressure
- 70% of rated capacity at 200 pounds net pressure
- 50% of rated capacity at 250 pounds net pressure
- 100% of rated capacity at 165 pounds net pressure

The entire pump, both suction and discharge passages, shall be hydrostatically tested to a pressure of 600 PSI. The pump shall be fully tested at the pump manufacturer's factory to the performance spots as outlined by NFPA 1901. The pump shall be free from objectionable pulsation and vibration.

**PUMP CERTIFICATION**

The pump shall be certified in U.S. gallons per minute (GPM).

**Will furnish section as written: Yes \_\_\_ NO \_\_\_ Exception # \_\_\_\_\_**

**FOAM PROPORTIONING SYSTEM TESTING**

The foam proportioning system shall be tested and certified after final installation as per NFPA 1901.

**12 VOLT SYSTEMS TEST**

After completion of the unit, the 12 volt electrical system shall undergo a battery of tests as listed in NFPA 1901. These tests shall include, but not be limited to:

- Reserve capacity test
- Alternator performance test at idle
- Alternator performance test at full load
- Low voltage alarm test

Certification of the results shall be supplied with the apparatus at the time of delivery.

**VEHICLE STABILITY**

The apparatus shall comply with the requirements of NFPA 1901 as it applies to vehicle stability. The particular apparatus as described in the specification provided within the bid package shall be classified into one of the following categories:

- The apparatus shall go through actual tilt table testing. This shall be determined by the apparatus manufacturer.
- The apparatus shall be equipped with a rollover stability control system as defined in section 4.13.1.2 of NFPA 1901.
- The apparatus shall be deemed a similar apparatus and meeting the intent of section 4.13.1.1.2 of NFPA 1901.

**TEN (10) YEAR WARRANTY BODY STRUCTURAL INTEGRITY**

The body shall be free of structural or design failure or workmanship for a period of ten (10) years or 100,000 miles starting thirty (30) days after the original invoice date.

**THREE (3) YEAR PAINT LIMITED WARRANTY**

The apparatus body and pump house shall be free of blistering, peeling and any other adhesion defect caused by defective manufacturing methods or paint material selection for exterior surfaces for a prorated period of three (3) years starting thirty (30) days after the original invoice date.

Paint on the undercarriage, body interior (Line-X® coating included) or aerial structure related paint, if applicable, is covered only under the Standard One (1) Year Limited Warranty.

**TEN (10) YEAR CORROSION LIMITED WARRANTY**

The body exterior paint shall be warranted against corrosion perforation for a prorated period of ten (10) years starting thirty (30) days after the original invoice date.

**TEN (10) YEAR STAINLESS STEEL PLUMBING LIMITED WARRANTY**

The stainless steel plumbing and piping shall be free from corrosion perforation for a period of ten (10) years starting thirty (30) days after the original invoice date.

**PUMP WARRANTY**

The fire pump shall be warranted by Hale Products Inc. for a period of five (5) years from the date the product is first placed into service or five and one-half (5-1/2) years from the shipment date by Hale, whichever period shall be first to expire. The warranty shall cover parts and labor for the first two (2) years. The remaining three (3) years of the warranty shall cover parts only.

**WATER TANK WARRANTY**

The tank shall be complete with a lifetime warranty. The tank manufacturer shall mark the tank and furnish notice that indicates proof of warranty.

**TWENTY (20) YEAR GALVANIZED SUBFRAME WARRANTY**

The galvanized subframe shall be free of structural or design failure or workmanship for a period of twenty (20) years starting thirty (30) days after the original invoice date.

**TWO (2) YEAR PROTECTION PLAN-MATERIAL AND WORKMANSHIP WARRANTY**

OEM installed purchased parts and fabricated parts shall be free of defects in material and workmanship for a period of two (2) years

**Will furnish section as written: Yes \_\_\_ NO \_\_\_ Exception # \_\_\_\_\_**

## **CHASSIS MODEL**

The chassis shall be a Gladiator model or equivalent. 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 model year that is current to the year of production.

## **APPARATUS TYPE**

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.

## **VEHICLE TYPE**

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.

## **AXLE CONFIGURATION**

The chassis shall feature a 4 x 2 axle configuration consisting of a single rear drive axle with a single front steer axle.

## **GROSS AXLE WEIGHT RATINGS FRONT**

The front gross axle weight rating (GAWR) of the chassis shall be 21,500 pounds.

This front gross axle weight rating shall be adequate to carry the weight of the completed apparatus including all equipment and personnel.

## **GROSS AXLE WEIGHT RATINGS REAR**

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.

**Will furnish section as written: Yes \_\_\_ NO \_\_\_ Exception # \_\_\_\_\_**

## **CAB STYLE**

The cab shall be a custom, fully enclosed, LFD 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 no more than 99.40 inches wide with a minimum interior width of approximately 91.00 inches. The overall cab length shall be no longer than 144.60 inches with 67.50 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 approximately 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 63.38 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 a minimum 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 minimum 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.

**Will furnish section as written: Yes \_\_\_ NO \_\_\_ Exception # \_\_\_\_\_**

### **OCCUPANT PROTECTION**

The vehicle shall include an **Occupant Protection System (OPS)** which shall secure belted occupants and increase the survivable space within the cab. The OPS 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 OPS shall also provide ejection mitigation protection.

The system components shall include:

- Driver steering wheel airbag
- Driver dual knee air bags with energy management mounting and officer knee airbag.
- Large driver, officer, and crew area side curtain airbags
- OPS 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 OPS 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, officer side knee airbag, and advanced seat belts for each occupant in the cab.

The OPS frontal impact system shall be independently tested to ensure occupant injury criteria does not exceed injury criteria defined in Federal Motor Vehicle Safety Standard (FMVSS) 208. Frontal impact into a rigid barrier at 25 mph shall be conducted by an independent third party test facility using belted 95<sup>th</sup> percentile Hybrid II test dummies.

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.

The OPS side impact system shall be independently tested to ensure occupant injury criteria does not exceed injury criteria defined in Federal Motor Vehicle Safety Standard (FMVSS) 214. Side impact from a moving barrier at 17 mph shall be conducted by an independent third party test facility using belted 50<sup>th</sup> percentile ES-2re test dummies.

**Will furnish section as written: Yes \_\_\_NO\_\_\_Exception # \_\_\_\_\_**

### **CAB FRONT FASCIA**

The front cab fascia shall be of the Spartan Evolution style, or similar, constructed of lightweight, impact resistant fiberglass reinforced plastic which shall be attached to the front cab skin to offer an appealing exterior. The cab fascia will encompass the front of the aluminum cab structure from the bottom of the windshield to the lower section of the cab.

The fascia shall include modules for two (2) single Hi/Low beam headlamps, the modules shall also provide a turn signal position integrated with the headlight bezel. The headlight bezel shall be removable, when removed there shall be easy access for maintenance of the light assemblies as well as access to the engine air intake ember separator, the electrical bulkhead connections, and the transmission electronic communications module. Stylized louvers are incorporated into the design of the fascia to enhance air flow to the cooling system.

The fascia shall also provide two (2) warning light positions below each of the headlamp modules for the installation of up to four (4) warning lights on the front cab fascia.

### **FRONT GRILLE**

The fascia shall include a stainless steel flat front grille. The grille shall be installed on the front of the cab fascia. 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 PPG Industries paint.

### **CAB PAINT PRIMARY/LOWER COLOR**

The lower paint color shall be PPG FBCH 71096 ALT Red.

### **CAB PAINT SECONDARY/UPPER ROOF COLOR**

The upper (roof) paint color shall be PPG FBCH 2185 white.

The mid paint color shall be PPG FBCH 9000 black.

### **CAB PAINT EXTERIOR BREAKLINE**

The upper and lower paint shall meet at a breakline on the cab which shall be located approximately 1.00 inch below the door windows on each side of the cab. On the front of the cab the breakline shall follow the body line on the cab fascia curving downward below the windshield wipers and above the headlamps until the breakline meets the cab grille near the corners of the grille approximately 11.00 inches below the top of the grille.

### **CAB PAINT PINSTRIPE**

Where the upper and lower paint colors meet a temporary 0.50 inch wide black pinstripe shall be applied over this break line to offer a more finished look prior to the final pinstripe being installed by the OEM.

### **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.

### **CAB PAINT INTERIOR**

The visible interior cab structure surfaces shall be painted with a multi-tone silver 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 barrier clear design resulting in exposed lower cab steps. The doors shall provide approximately 32.00 inches of clearance from the ground to the bottom of the door so cab doors may be opened un-hindered by most obstacles encountered, such as guard rails along interstate highways.

### **CAB INSULATION**

The cab ceiling and walls shall include 1.00 inch thick foam insulation. The insulation shall act as a barrier absorbing noise as well as assisting in sustaining the desired climate within the cab interior.

### **STREET SIDE EXTERIOR REAR COMPARTMENT**

The cab shall offer an exterior compartment on the street side of the cab behind the rear door. The compartment opening shall be 10.00 inches wide X 21.19 inches high. The compartment size shall be 11.34 inches wide X 21.19 inches high X 21.19 inches deep. The compartment shall have a 10.63 inch wide, 32.00 inch high and 1.50 inch thick hinged box pan style flush mount door with a bright aluminum tread plate inner panel and a bent D-ring slam latch. There shall be a switch to activate a light inside the compartment and the open compartment warning light in the cab in the event the door is left ajar.

### **STREET SIDE EXTERIOR REAR COMPARTMENT LIGHTING**

There shall be one (1) SoundOff Signal brand LED strip light installed to illuminate the exterior rear compartment on the street side of the cab. The strip light shall be 10.00 inches long and shall include three (3) bright white Gen3 LEDs.

**STREET SIDE EXTERIOR COMPARTMENT INTERIOR FINISH**

The interior of the street side exterior compartment shall have a DA sanded finish.

**CURB SIDE EXTERIOR REAR COMPARTMENT**

The cab shall offer an exterior compartment on the curb side of the cab behind the rear door. The compartment opening shall be 10.00 inches wide X 21.19 inches high. The compartment size shall be 11.34 inches wide X 21.19 inches high X 21.19 inches deep. The compartment shall have a 10.63 inch wide, 32.00 inch high and 1.50 inch thick hinged box pan style flush mount door with a bright aluminum tread plate inner panel and a bent D-ring slam latch. There shall be a switch to activate a light inside the compartment and the open compartment warning light in the cab in the event the door is left ajar.

**CURB SIDE EXTERIOR REAR COMPARTMENT LIGHTING**

There shall be one (1) SoundOff Signal brand LED strip light installed to illuminate the exterior rear compartment on the curb side of the cab. The strip light shall be 10.00 inches long and shall include three (3) bright white Gen3 LEDs.

**CURB SIDE EXTERIOR COMPARTMENT INTERIOR FINISH**

The interior of the curb side exterior compartment shall have a DA sanded finish.

**CAB STRUCTURAL WARRANTY**

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.

**RADIO ANTENNA INSTALLATION**

There shall be two (2) radio antennas provided and installed on the roof of the cab/chassis. The end of each radio antenna shall be routed to a location determined by the ST. LOUIS FIRE DEPARTMENT.

Due to multiple configurations of antenna whips, the type of antenna will be indicated at pre-construction by the St .Louis Fire Department and installed by chassis builder as indicated above. **Antenna #1 Motorola Model HAF4017A / GPS antenna for computer. Mobile Mark SMD-3500**

**Will furnish section as written: Yes \_\_\_ No \_\_\_**

**Will furnish section as written: Yes \_\_\_ NO \_\_\_ Exception # \_\_\_\_\_**

**ELECTRICAL SYSTEM**

The chassis shall include a single starting electrical system which shall include a 12 volt direct current Weldon brand of 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.

## **WELDON LINK2**

A Weldon Link<sub>2</sub> module shall be provided. It shall consist of a J1939 enabled hardware device connected into the chassis J1939 Controller Area Network (CAN) data bus. The device shall monitor J1939 CAN data transmitted over the data bus and write the data to non-volatile memory. Collected data shall be wirelessly uploaded to secure remote servers via the customer's configured Wi-Fi 802.11 a/b/g/n network access point. The **device shall** be configured to monitor CAN messages broadcast over the apparatus J1939 CAN data link and be capable of capturing and transmitting at a minimum the following data parameters:

- **Engine/PTO/Aerial/Generator Hours**
- **Mileage**
- **Engine diagnostic Codes (CEL/SEL)**
- **ABS diagnostic codes**
- **Transmission diagnostic codes**
- **Run Status**
- **Emergency Warning Status**
- **Interlock Status**
- **Low Voltage**
- **Park and Service Brake actuation**
- **Event Fuel Consumption (Gallons per hour)**
- **Tank level status**
- **Other data as deemed available by the OEM**
- **Custom defined parameters**

The **Link<sub>2</sub>** hardware device shall consist of an industry proven Deutsch IP6# sealed enclosure with corresponding dual Deutsch harness connectors. The device shall include provisions for an active antenna output that will allow for an antenna to be routed to the roof. The device shall include diagnostic LEDs providing a visual indication of the module's operational readiness (power, communication) and status of WiFi 802.11 a/b/g/n network connectivity. The module settings and wireless connections shall be configured by connecting a USB cable to the device.

The Link<sub>2</sub> device shall upload data that is accessible through the Weldon Link<sub>2</sub> online dashboard, accessed at [link2dashboard.com](http://link2dashboard.com).

The apparatus OEM shall be responsible for ensuring the above data elements are accessible to be recorded by the Link<sub>2</sub>. The device shall also be capable of recording non-CAN functions through a series of analog, digital and frequency inputs on the device. The OEM or installer shall be responsible for determining if a particular data parameter shall be accessed via the J1939 CAN or provisioned via available hardware input circuits.

The device shall incorporate a twenty (20) year rated lithium battery to maintain real-time clock functions. The Link<sub>2</sub> shall have a connection to constant battery voltage necessary to perform operational transmit and receive functions for a period of time after the apparatus is powered down.

## **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. A 225 amp battery direct power and ground stud shall be provided and installed on the chassis near the left hand battery box for OEM body connections.

## **AUXILIARY ACCESSORY POWER**

Two (2) auxiliary sets of power and ground studs shall be provided and installed behind the electrical center cover with a 40 amp breaker. The studs shall be 0.38 inch diameter and capable of carrying up to a 40 amp load switched battery direct.

## **EXTERIOR ELECTRICAL TERMINAL COATING**

All terminals exposed to the elements will be sprayed with a high visibility protective rubberized coating to prevent corrosion.

**Will furnish section as written: Yes \_\_\_NO\_\_\_Exception #\_\_\_\_\_**

## **ENGINE**

The chassis engine shall be a Cummins ISL9 engine. The ISL9 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 1400 RPM with 543 cubic inches (8.9 liters) of displacement.

The ISL9 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 2013 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 CJ4 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 alloy plate. The side walls shall be tapered from the top of the seatbox to an angle of 22.00 degrees from vertical. The tapered tunnel will provide 3.00 inches of additional inboard hip room for both the driver and officer seating positions. The rear of the tunnel shall be shortened to provide 2.00 inches of additional crew space behind the tunnel.

### **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 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 master switch is activated 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**

The engine shall include programming which will govern the top speed of the vehicle.

### **AUXILIARY ENGINE BRAKE**

The engine shall utilize a variable geometry turbo (VGT). The VGT auxiliary engine brake shall be an integral part of the turbo and shall offer a variable rate of exhaust flow, which when activated shall slow the engine and in turn slow the vehicle.

The VGT shall actuate the vehicle's brake lights when engaged as an auxiliary brake. A cutout relay shall be installed to disable the VGT when in pump mode or when an ABS event occurs. The VGT engine brake shall activate at a 0% accelerator throttle position when in operation mode.

### **AUXILIARY ENGINE BRAKE CONTROL**

An engine variable geometry turbo 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 variable geometry turbo brake shall be controlled via a 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**

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**

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**

The engine shall include an original equipment manufacturer installed magnetic oil drain plug.

### **ENGINE WARRANTY**

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

### **REMOTE THROTTLE HARNESS**

An apparatus interface wiring harness for the engine and transmission pump interlocks shall be supplied with the chassis. The harness shall include a connector for connection to a chassis pump panel harness supplied by the body builder and shall terminate in the left frame rail behind the cab for connection by the body builder. The harness shall include circuits deemed for a pump panel and shall contain circuits for a hand throttle, and a multiplexed gauge. Separate circuits shall also be included for a pump control switch, "Pump Engaged" and "OK to Pump" indicator lights, open compartment ground, start signal, park brake ground, ignition signal, master power, clean power, customer ignition, air horn solenoid switch, high idle switch and high idle indicator light.

### **ENGINE PROGRAMMING REMOTE THROTTLE**

The engine ECM discreet wire remote throttle circuit will be turned on for use with a discreet wire based pump controller.

### **ENGINE PROGRAMMING IDLE SPEED**

The engine low idle speed will be programmed at 700 rpm.

### **ENGINE FAN DRIVE**

The engine cooling system fan shall incorporate a thermostatically controlled, Horton clutched type fan drive.

When the clutched fan is disengaged it shall 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.

### **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 utilize 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, an air to air 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 injection molded polymer eleven (11) blade fan with a 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 sight glass 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.

### **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 color.

### **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.

### **ENGINE COOLANT FILTER**

An engine coolant filter with a shut-off valve for the inlet and outlet shall be installed on the chassis. The location of the filter shall allow for easy maintenance.

Proposals offering engines equipped with coolant filters shall be supplied with standard non-chemical type particulate filters.

### **ELECTRONIC COOLANT LEVEL INDICATOR**

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**

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**

The cooling system hoses shall be silicone heater hose with rubber hoses in the cab interior. The radiator hoses shall be formed silicone coolant hoses with formed aluminized steel tubing. All heater hose, silicone coolant hose, and tubing shall be secured with stainless steel constant torque band clamps.

### **ENGINE AIR INTAKE**

The engine air intake system shall include an ember separator air intake filter which shall be located in the front of the cab behind the right hand side fascia. This filter shall protect the downstream air filter from embers using a combination of unique flat and crimped metal screens constructed into a corrosion resistant heavy duty galvanized steel frame. This multilayered screen shall be designed to trap embers or allow them to burn out before passing through the pack, while creating only minimal air flow restriction through the system. Periodic cleaning or replacement of the screen shall be all that is required after installation.

The engine air intake system shall also include a stainless steel air cleaner mounted to the frame and located beneath the cab on the right side of the vehicle. The air cleaner shall utilize a replaceable filter element designed to prevent dust and debris from being ingested into the engine. The air cleaner housing and connections in the air intake system shall be designed to mitigate water intrusion into the system during severe weather conditions.

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.

### **AIR INTAKE PROTECTION**

A light duty skid plate shall be supplied for the engine air intake system below the right front side of the cab. The skid plate shall provide protection for the air intake system from light impacts, stones, and road debris. The skid plate shall be painted to match the lower body.

### **ENGINE EXHAUST SYSTEM**

The exhaust system shall include a diesel particulate filter (DPF), a diesel oxidation catalyst, 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 injected into the system through the decomposition tube between 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 DPF, the decomposition tube, and the SCR canister 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 shall be mounted below the frame in the outboard position with the SCR canister in line rearward of the DPF.

### **DIESEL EXHAUST FLUID TANK**

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 installed 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.

### **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.

**Will furnish section as written: Yes \_\_\_ NO \_\_\_ Exception # \_\_\_\_\_**

### **TRANSMISSION**

The drive train shall include an Allison model EVS 3000 torque converting, automatic transmission which shall include electronic controls and an output retarder. 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:

1st	3.49:1
2nd	1.86:1
3rd	1.41:1
4th	1.00:1
5th	0.75:1
6th	0.65:1 (if applicable)
Rev	5.03:1

### **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.

<u>Function ID</u>	<u>Description</u>	<u>Wire assignment</u>
<b>Inputs</b>		
C	PTO Request	142
J	Fire Truck Pump Mode (4th Lockup)	122 / 123
<b>Outputs</b>		
C	Range Indicator	145 (4th)
G	PTO Enable Output	130
	Signal Return	103

**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 RETARDER CONTROL**

The Allison transmission retarder shall be engaged with the first one-third at 0% throttle and the remaining two-thirds shall be modulated by brake pedal actuation. The system shall include a retarder on/off virtual button on the Vista display and control screen. The engagement of the retarder shall activate the brake lights. The retarder shall be inactive during pump mode.

**TRANSMISSION RETARDER CAPACITY LEVEL**

The transmission retarder shall be programmed so the maximum retardation shall be at the high capacity level.

**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.

**Will furnish section as written: Yes \_\_\_ NO \_\_\_ Exception # \_\_\_\_\_**

### **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 Spicer 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®.

### **PUMP SHIFT CONTROLS**

One (1) pump shift control panel shall be mounted on the lower left section of the center dash panel. The following shall be provided on the panel: a three (3) position locking toggle switch; 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. One (1) label indicating pump instructions and 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 switch is in the up position and pump mode shall be selected when the switch is in the down position.

The center switch 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 FS1003 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 black textile braided lines which are reinforced with braided high tensile steel wire. The fuel lines shall be connected with reusable steel fittings.

### **ELECTRIC FUEL PRIMER**

Integral to the engine assembly is an electric lift pump that serves the purpose of pre-filter fuel priming.

### **FUEL COOLER**

An aluminum cross flow air to fuel cooler shall be provided to lower fuel temperature allowing the vehicle to operate at higher ambient temperatures. The fuel cooler shall be located behind the rear axle.

### **FUEL TANK**

The fuel tank shall have a capacity of fifty (50) gallons and shall measure 35.00 inches in width X 19.00 inches in height X 18.50 inches in length. The increased height and reduced length allows for the use of a shorter rear frame overhang on the chassis. The baffled tank shall be made of 14 gauge aluminized steel. The exterior of the tank shall be painted with a PRP Corsol™ black anti-corrosive exterior metal treatment finish. This results in a tank which offers the internal and external corrosion resistance.

The 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 14 gauge aluminized steel. The exterior of the fuel tank shall be coated with Line-X or equivalent spray on protective coating.

#### **FUEL TANK STRAP MATERIAL**

The fuel tank straps shall be constructed of ASTM A-36 steel.

#### **FUEL TANK FILL PORT**

The fuel tank fill ports shall be in-line with the left and right side fill ports located in the forward position of the fuel tank.

#### **FUEL TANK SERVICEABILITY PROVISIONS**

The chassis fuel lines shall have additional length provided so the tank can be easily lowered and removed for service purposes. The additional 8.00 feet of length shall be located above the fuel tank and shall be coiled and secured. The fuel line fittings shall be pointed towards the right side (curbside) of the chassis.

#### **FUEL TANK DRAIN PLUG**

A 0.5 inch NPT drain plug shall be centered in the bottom of the fuel tank.

**Will furnish section as written: Yes \_\_\_ NO \_\_\_ Exception # \_\_\_\_\_**

#### **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. The weight capacity for the axle shall be rated to 21,500 pounds FAWR.

#### **FRONT AXLE WARRANTY**

The front axle shall be warranted by Meritor for two (2) years with unlimited miles under the general service application.

#### **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 nine (9) 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.

**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 85 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.

**Will furnish section as written: Yes \_\_\_ NO \_\_\_ Exception # \_\_\_\_\_**

**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 two (2) years with unlimited miles under the general service application.

#### **REAR WHEEL BEARING LUBRICATION**

The rear axle wheel bearings shall be lubricated with oil.

#### **VEHICLE TOP SPEED**

The top speed of the vehicle shall be approximately 65 MPH +/-2 MPH at governed engine RPM.

#### **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.

**Will furnish section as written: Yes \_\_\_ NO \_\_\_ Exception # \_\_\_\_\_**

#### **FRONT TIRE**

The front tires shall be Yokohama MY507A 425/65R-22.5 20PR "L" tubeless radial regional tread. Part Number 50752.

#### **REAR TIRE**

The rear tires shall be Yokohama MY627 315/80R-22.5 20PR "L" tubeless radial highway tread. Part Number 62702.

#### **REAR AXLE RATIO**

The rear axle ratio shall be 4.30:1.

#### **TIRE PRESSURE EQUALIZATION SYSTEM**

There shall be a voucher provided with the chassis for Crossfire dual tire equalization system provided on both sets of dual tires on the rear axle. The Crossfire pressure system shall equalize and monitor tire pressure through the valve which is mounted between the dual tires. This shall bolt easily to the drive axle end allowing air to flow freely from one tire to the other, maintaining equal tire pressure and load distribution. The Crossfire system shall maximize tire life, decrease rolling resistance for increased fuel mileage and improve stability braking and overall safety.

The Crossfire dual tire equalization system shall be redeemed upon the vehicle manufacturer's receipt of the voucher along with the vehicle in-service weight for each axle.

### **TIRE PRESSURE INDICATOR**

There shall be a voucher provided with the chassis for a pop up style tire pressure indicator at the front tire valve stem. The indicator shall provide visual indication of pressure in the specific tire.

The tire pressure indicators shall be redeemed upon the vehicle manufacturer's receipt of the voucher for installation by the customer.

### **FRONT WHEEL**

The front wheels shall be Alcoa hub piloted, 22.50 inch X 12.25 inch LvL One™ polished 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 shall include Alcoa's Dura-Bright® finish with XBR technology as an integral part of the wheel surface.

### **REAR WHEEL**

The rear wheels shall be Alcoa hub piloted heavy duty, 22.50 inch X 8.25 inch LvL One™ aluminum wheels with a polished outer surface and Alcoa Dura-Bright® wheel treatment with XBR® technology as an integral part of the wheel. The hub piloted mounting system shall provide easy installation and shall include two-piece flange nuts.

### **WHEEL TRIM**

The front wheels shall include stainless steel lug nut covers and stainless steel baby moons shipped loose with the chassis for installation by the apparatus builder. 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 shipped loose with the chassis for installation by the apparatus builder.

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.

**Will furnish section as written: Yes \_\_\_ NO \_\_\_ Exception # \_\_\_\_\_**

### **BRAKE SYSTEM**

A rapid build-up air brake system shall be provided. The air brakes shall include 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 lose 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. Pads and rotors shall be cryogenically treated.

### **REAR BRAKES**

The rear brakes shall be Meritor 16.50 inch X 8.63 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.

In addition to the mechanical rear brake engagement, the front service brakes will also engage via air pressure, providing additional braking capability.

### **PARK BRAKE CONTROL**

A Meritor-Wabco manual hand control push-pull style valve shall operate the parking brake system. The control shall be yellow in color.

The parking brake actuation valve shall be mounted in the left hand switch panel.

### **EMERGENCY SPRING BRAKE RELEASE**

An emergency spring brake release system shall be installed on the chassis. The emergency spring brake release system shall include a separate isolated pressure protected 1200 cubic inch air reservoir with gauge and a "push and hold" brake release valve located in the center of the cab dash within reach of the driver and officer.

### **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 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 mounted behind the battery box on the left hand side.

## **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 30/30 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 30 brake chamber shall offer a 30.00 square inch effective area.

**Will furnish section as written: Yes \_\_\_ NO \_\_\_ Exception # \_\_\_\_\_**

## **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 on the left frame rail behind the battery box.

## **MOISTURE EJECTORS**

Manual pet-cock type drain valves 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.

Brass compression type fittings shall be used on the nylon tubing. All drop hoses shall include fiber reinforced neoprene covered hoses.

## **AIR HORN SHUTOFF VALVE**

A shut-off valve shall be installed in the air horn supply line under the left front seat.

## **VEHICLE TOWED AIR SUPPLY PACKAGE**

The chassis shall include a vehicle towing air supply package. The air supply connection shall be accomplished via an ARO-210 type quick connect fitting. This fitting is compatible with Milton 'A' and Milton 'S' style fittings. The connection shall be located at the front of the vehicle below the left hand side of the bumper.

The fitting shall allow a service tow truck to tie into the disabled vehicle's air system to provide air supply to disengage the parking brake for towing.

## **WHEELBASE**

The chassis wheelbase shall be 211.00 inches.

## **REAR OVERHANG**

The chassis rear overhang shall be 85.00 inches.

**Will furnish section as written: Yes \_\_\_ NO \_\_\_ Exception # \_\_\_\_\_**

## **FRAME**

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.

The frame and cross members shall carry a lifetime warranty to the original purchaser. A copy of the frame warranty shall be made available upon request.

Proposals offering warranties for frames not including cross members shall not be considered.

## **FRAME WARRANTY**

Summary of Warranty Terms:

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.

## **FRAME PAINT**

The frame shall be powder coated black prior to any attachment of 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 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.

There shall be an RTV type sealant applied to the seams between the frame rail and the liner(s) to help prevent water intrusion between the frame rails. The sealant shall be applied to all seams along the length of the frame and at the front and rear ends of the liner(s). The sealant shall be applied after the frame rails have been assembled and painted.

Any proposals offering painted frame 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.

The chassis under carriage consisting of frame, axles, driveline running gear, air tanks and other chassis mounted components shall be painted with gloss black paint. Paint shall be applied prior to airline and electrical wiring installation.

**Will furnish section as written: Yes \_\_\_ NO \_\_\_ Exception # \_\_\_\_\_**

### **FRONT BUMPER**

The chassis shall be equipped with a severe duty front bumper constructed from structural steel channel. The bumper material shall be 0.38 thick ASTM A36 steel which shall measure 12.00 inches high with a 3.05 inch flange and shall be 104.50 inches wide with angled front corners.

The bumper shall be primed and painted as specified.

### **FRONT BUMPER EXTENSION LENGTH**

The front bumper shall be extended approximately 24.00 inches ahead of the cab.

### **FRONT BUMPER EXTENSION FRAME WIDTH**

The front bumper extension frame shall feature an overall width of 48.25 inches.

### **FRONT BUMPER PAINT**

The front bumper shall be painted to match lower body color.

### **FRONT BUMPER TRIM**

A polished stainless steel trim band, 11.50 inches high, shall be installed on the center of the bumper face extending the entire length of the bumper. The stainless steel trim shall be affixed without holes and fasteners.

### **FRONT BUMPER APRON**

The 24.00 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.

### **AIR HORN**

The chassis shall include two (2) Hadley brand E- Tone air horns which shall measure 24.00 inches long with a 6.00 inch round flare. The air horns shall be trumpet style with a chrome finish on exterior and a painted finish deep inside the trumpet.

### **AIR HORN LOCATION**

The air horns shall be recess mounted in the front bumper face, one (1) on the right side of the bumper in the inboard position relative to the right hand frame rail and one (1) on the left side of the bumper in the inboard position relative to the left hand frame rail.

### **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) Federal Signal model BP200-Q, 200 watt speaker provided. The speaker shall measure 5.50 inches tall X 7.70 inches wide X 7.80 inches deep. The speaker shall include the classic Q-style grille which shall measure 9.87 inches in diameter.

## **ELECTRONIC SIREN SPEAKER LOCATION**

The electronic siren speaker shall be located on the front bumper face on the left side outboard of the frame rail in the far outboard position.

## **FRONT BUMPER TOW HOOKS**

Two (2) heavy duty tow hooks, painted to match the chassis frame, shall be installed in a rearward position out of the approach angle area, bolted directly to the side of the chassis frame with grade 8 bolts.

## **TOW FORK PROVISION**

Two (2) heavy duty tubular steel towing forks shall be welded to the underside of the frame drop at the front of the chassis. The tubes shall be shaped like an upside down "U" to act as a designated hookup point to accept a tow bar from a service vehicle. The robust design shall allow a disabled vehicle to be lifted and towed without doing damage to the bumper or bumper mounted options.

**Will furnish section as written: Yes \_\_\_ NO \_\_\_ Exception # \_\_\_\_\_**

## **CAB TILT SYSTEM**

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 AUXILIARY PUMP**

A manual cab tilt pump module shall be attached to the cab tilt pump housing.

## **CAB TILT LIMIT SWITCH**

A cab tilt limit switch shall be installed. The switch will effectively limit the travel of the cab when being tilted. The limit adjustment of the switch shall be preset by the chassis manufacturer to prevent damage to the cab or any bumper mounted option mounted in the cab tilt arc. Further adjustment to the limit by the apparatus manufacturer shall be available to accommodate additional equipment.

### **CAB TILT CONTROL RECEPTACLE**

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 receptacle 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.

### **Equipment mounting / stowage instructions:**

Install **manual cab lift handle** on the forward wall of the hose fitting compartment.

### **CAB WINDSHIELD**

The cab windshield shall have a surface area of 2969.88 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 include a dark gray automotive tint which shall allow forty-five percent (45%) light transmittance. The dark tint shall aid in cab cooling and help protect passengers from radiant solar energy.

### **GLASS REAR DOOR CURB SIDE**

The rear curb side door shall include a window which is approximately 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 CURB SIDE**

The window located in the curb side rear window shall include a dark gray automotive tint which shall allow forty-five percent (45%) light transmittance. The dark tint shall aid in cab cooling and help protect passengers from radiant solar energy.

### **GLASS REAR DOOR STREET SIDE**

The rear street 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 STREET SIDE**

The window located in the street side rear door shall include a dark gray automotive tint which shall allow forty-five percent (45%) light transmittance. The dark tint shall aid in cab cooling and help protect passengers from radiant solar energy.

#### **GLASS MID CURB SIDE**

The cab shall include a window on the curb side behind the front and ahead of the crew doors which shall measure approximately 16.00 inches wide X 14.00 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.

#### **GLASS TINT MID CURB SIDE**

The window located on the curb side of the cab between the front and rear doors shall include a dark gray automotive tint which shall allow forty-five percent (45%) light transmittance. The dark tint shall aid in cab cooling and help protect passengers from radiant solar energy.

#### **GLASS MID STREET SIDE**

The cab shall include a window on the street side behind the front door and ahead of the crew doors and above the wheel well which shall measure 16.00 inches wide X 26.00 inches high. This window shall be capable of sliding vertically within this space and shall be rectangular in shape. The window shall be mounted in a black anodized aluminum frame with lower drain slots.

#### **GLASS TINT MID STREET SIDE**

The window located on the street side of the cab between the front and rear doors shall include a dark gray automotive tint which shall allow forty-five percent (45%) light transmittance. The dark tint shall aid in cab cooling and help protect passengers from radiant solar energy.

#### **CLIMATE CONTROL**

The cab shall be equipped with a ceiling mounted combination defrost / heating and air-conditioning system mounted above the engine tunnel in a central location.

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 systems cover shall provide quick access to washable air intake filters as well as easy access to other serviceable items.

The air delivery plenums provide targeted airflow directly to the vehicle occupants. Six (6) adjustable louvers will provide comfort for the front seat occupants and ten (10) adjustable louvers will provide comfort for the rear occupants.

The system shall be capable of producing up to 12 FPM of air velocity at all occupant seating positions. Separate front and rear blower motors shall be of brushless design and shall be controlled independently. The system shall be capable of reducing the interior cabin air temperature from 122 degrees F (+/- 3 degrees F) to 80 degrees F in thirty minutes with 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 Aero-quip GH134 flexible hose with Aero-quip EZ-Clip fittings.

The overhead heater/defrost plumbing shall include an electronic 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.

### **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.

### **CLIMATE CONTROL ACTIVATION**

The heating, defrosting and air conditioning controls shall be located on the center switch panel in the lower center section in a position easily accessible to the driver and the officer. The climate control shall be activated by a rotary switch.

### **HVAC OVERHEAD COVER PAINT**

The overhead HVAC cover shall be painted with a multi-tone silver 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, open type compressor that shall be capable of producing a minimum of 32,000 BTU at 1500 engine RPMs. The compressor shall utilize R-134A refrigerant and PAG oil.

### **CAB CIRCULATION FANS FRONT**

The cab shall include two (2) all metal 6.00 inch air circulation fans installed in the outer front cab corners. Each fan shall be controlled by an individual toggle switch on each fan. The fans can be used to help defog the windshield or to increase air circulation for passenger comfort.

**Will furnish section as written: Yes \_\_\_ NO \_\_\_ Exception # \_\_\_\_\_**

### **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 0.75 inch thick including a vertically lapped polyester fiber layer, a 1.0 lb/ft<sup>2</sup> PVC barrier layer, an open cell foam layer, and a moisture and heat reflective foil facing reinforced with a woven fiberglass layer. The foil surface acts as protection against 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 3 mils of acrylic pressure sensitive adhesive and aluminum pins with hard hat, hold in place fastening heads.

### **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.

The floor shall have an overlay of 5052-H32 aluminum plate with a Line-X type liner finish. The aluminum plate shall be held down with screws and aluminum trim moldings. The step well area aluminum trim molding shall feature a Mebac® grit surface finish. 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.

Proposals offering any step well trim molding other than with the Mebac® brand surface shall not be considered.

### **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.

### **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 trim shall be constructed of 5052-H32 Marine Grade, 0.13 of an inch thick aluminum plate and shall include a Mobile Data Terminal (MDT) provision. The glove box shall be eliminated in order to provide for a deeper access for the MDT.

### **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.

### **POWER POINT DASH MOUNT**

The cab shall include two (2) 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. One in the cab dash to provide a power source for USB chargeable electrical equipment and one on the engine tunnel rear to be accessible to the crew members. The USB port shall be capable of a 5 Volt-500 milliampere 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 polished 5032 H32 aluminum Grip Strut® grating with angled outer corners. The step shall feature a splash guard to reduce water and debris from splashing in to the step. The splash guard shall have an opening on the outer edge to allow debris and water to flow through rather than becoming trapped within the stepping surface. 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 street side 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 inch thick aluminum plate. The door panels shall include a DA sanded finish.

### **DOOR TRIM CUSTOMER NAMEPLATE**

The interior door trim on the front doors shall include a customer nameplate which states the vehicle was built for the St. Louis Fire 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. 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.

### **ADDITIONAL INTERIOR GRAB HANDLE REAR DOOR**

Each interior rear door shall include an additional grab handle. The handle shall be an ergonomically contoured 9.00 inch long cast aluminum grab handle. Each handle shall be mounted horizontally on the upper interior door trim panel. Each handle shall be textured and feature a black powder coat finish and shall assist personnel entering and exiting the cab.

the crew area of the cab. The strip light shall be 32.00 inches long and shall include nine (9) bright white Gen3 LEDs.

#### **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.

#### **HEADER TRIM INTERIOR PAINT**

The metal surfaces in the header area shall be coated with multi-tone silver gray texture finish.

#### **TRIM CENTER DASH INTERIOR PAINT**

The entire center dash shall be coated with multi-tone silver 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 a multi-tone silver gray texture finish.

#### **TRIM RIGHT HAND DASH INTERIOR PAINT**

The right hand dash shall be painted with multi-tone silver gray texture finish.

#### **FLOOR INTERIOR PAINT**

The metal surfaces on the floor of the cab shall be coated with medium gray Line-X type liner.

**Will furnish section as written: Yes \_\_\_ NO \_\_\_ Exception # \_\_\_\_\_**

#### **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 left panel shall be a textured aluminum panel within comfortable reach of the driver.

#### **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 light. 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 one (1) windshield wiper/washer control switch located in the left hand side of the panel. The switch shall have backlighting provided.

## **SWITCHES RIGHT PANEL**

The right dash panel shall include no rocker switches or legends.

**Will furnish section as written: Yes \_\_\_NO\_\_\_Exception # \_\_\_\_\_**

## **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), an indicator light in the instrument panel, and an audible alarm.

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 audible alarm shall remain active until all occupied seats have the seat belts fastened.

## **SEAT MATERIAL**

The seats shall include a covering of extra 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 1800 and Durawear Plus.

## **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 "StLFD" 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 Firefighter Sierra model seat. The seat shall feature eight-way electric positioning. The eight positions shall include up and down, fore and aft with 8.00 inches of travel, back angle adjustment and seat rake adjustment. The seat shall feature integral springs to isolate shock.

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, automatic retractor and buckle as an integral part of the seat assembly.

The minimum vertical dimension from the seat H-point to the ceiling for this belted seating position shall be 35.00 inches measured with the seat height adjusted to the lowest position of 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.

**The seat shall be 22" wide.**

### **POWER SEAT WIRING**

The power seat or seats installed in the cab shall be wired directly to battery power.

### **SEAT BACK DRIVER**

The driver's seat shall include a standard seat back incorporating the all belts to seat feature (ABTS). The seat back shall 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 Occupant Protection System (OPS). The OPS 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 OPS shall also provide ejection mitigation protection.

The driver's seating area OPS 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 with energy management mounting - 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 Firefighter series. The seat shall feature a tapered and padded seat, and cushion. The seat shall be a non-adjustable type seat.

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 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.

**The seat shall be 22" wide.**

### **SEAT BACK OFFICER**

The officer's seat shall feature a SecureAll™ SCBA locking system which shall be one bracket model and store most U.S. and International SCBA brands and sizes while in transit or for storage within the seat back. The bracket shall be easily adjustable for all SCBA brands and cylinder diameters. All adjustment points shall utilize similar hardware and adjustments shall be made with one tool.

The bracket shall be adjustable to compensate for different cylinder lengths without the use of tools. The adjustment shall be made by raising a lever and moving the top clamp vertically.

The bracket system shall be free of straps and clamps that may interfere with auxiliary equipment on SCBA units. The center guide fork shall keep the SCBA tank in place for a safe and comfortable fit in the seat back cavity. The SCBA unit simply needs to be pushed against the pivot arm to engage the patented auto-locking system. Once the lock is engaged, the top clamp shall surround the top of the SCBA tank for a secure fit in all directions.

The SecureAll™ shall include a release handle which shall be integrated into the seat cushion for quick and easy release. This shall eliminate the need for straps or pull cords to interfere with other SCBA equipment.

### **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 an occupant protection system (OPS). The OPS 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 OPS shall also provide ejection mitigation protection.

The officer's seating area OPS 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.

**Equipment supplied: stowed or installed in this compartment:**

1-Fire Hooks Maximus Halligan Tool-step insert

1-Bad Ax forcible entry tool-door

1-GETAC B300 Computer with Havis Docking Station-cab dash

1-Scott Air-Pak X3 w/snap change , standard harness, 5.5 system, EZ-Scape Pro fixed belt, EZ Scape System, 50' t-Safe rope, Crosby hook, F4 descender, standard regulator, Dual EBSS, SEMSII with Bluetooth, 5500 psi / 45 min. carbon fiber cylinder, AV300-HT face piece with Kevlar Head net and right Side Communications bracket.

1-St. Louis Fire Department compatible Knox Box

### **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.

### **SEAT REAR FACING OUTER LOCATION**

The crew area shall include one (1) rear facing crew seat located directly behind the left hand 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 Firefighter series. The seat shall feature a tapered and padded seat, and cushion. . The seats and cushion shall be hinged and compact in design for additional room and be able to be locked in the down position until released.

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 seat and cushion shall be hinged and compact in design for additional room and be able to be locked in the down position until released.

The minimum vertical dimension from the seat H-point to the ceiling for each 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 rear facing outboard seat shall feature a Bostrom SecureAll™ self contained breathing apparatus (SCBA) locking system which shall store most U.S. and International SCBA brands and bottle sizes while in transit or for storage within the seat back. The bracket shall be easily adjustable for all SCBA brands and cylinder diameters. All adjustment points shall utilize similar hardware and adjustments shall be made with one tool.

The bracket shall be adjustable to compensate for different cylinder lengths without the use of tools. The adjustment shall be made by raising a lever and moving the top clamp vertically.

The bracket system shall be free of straps that may interfere with auxiliary equipment on SCBA units. The center guide fork shall keep the SCBA tank in place for a safe and comfortable fit in the seat back cavity. The SCBA unit simply needs to be pushed against the pivot arm to engage the patented auto-locking system. Once the lock is engaged, the top clamp shall surround the top of the SCBA tank for a secure fit in all directions.

The SecureAll™ shall include a release handle which shall be integrated into the center of the bottom seat cushion for easy access and to eliminate hooking the release handle with clothing or other equipment.

The seat back shall include a removable padded cover which shall be provided over the SCBA cavity.

**The seat shall be 22" wide.**

### **SEAT MOUNTING REAR FACING OUTER**

The rear facing outer seat shall be mounted facing the rear of the cab.

### **OCCUPANT PROTECTION RFO**

The rear facing outer seat position(s) shall be equipped with an Occupant Protection System™ (OPS). The OPS 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 OPS shall also provide ejection mitigation protection.

Each rear facing outer seating position OPS shall include:

- OPS 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.

### **Equipment supplied: stowed or installed in this compartment:**

1-Scott Air-Pak X3 w/snap change , standard harness, 5.5 system, EZ-Scape Pro fixed belt, EZ Scape System, 50' t-Safe rope, Crosby hook, F4 descender, standard regulator, Dual EBSS, SEMSII with Bluetooth, 5500 psi / 45 min. carbon fiber cylinder, AV300-HT face piece with Kevlar Head net and right Side Communications bracket.

### **SEAT FORWARD FACING OUTER LOCATION**

The crew area shall include two (2) forward facing outboard seats, which include one (1) located next to the outer wall of the cab on the left side of the cab and one (1) located next to the outer wall on the right side of the cab.

### **SEAT CREW FORWARD FACING OUTER**

The crew area shall include two seats in the forward facing outer position which shall be a H.O. Bostrom Firefighter series. The seat shall feature a tapered and padded seat back and cushion. The seats and cushion shall be hinged and compact in design for additional room and be able to be locked in the down position until released.

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 seats and cushion shall be hinged and compact in design for additional room and be able to be locked in the down position until released.

The minimum vertical dimension from the seat H-point to the ceiling for each 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.

**The seat shall be 22" wide.**

### **SEAT BACK FORWARD FACING OUTER**

The forward facing outboard seat shall feature a SecureAll™ self contained breathing apparatus (SCBA) locking system which shall be one bracket model and store most U.S. and International SCBA brands and sizes while in transit or for storage within the seat back. The bracket shall be easily adjustable for all SCBA brands and cylinder diameters. All adjustment points shall utilize similar hardware and adjustments shall be made with one tool.

The bracket shall be adjustable to compensate for different cylinder lengths without the use of tools. The adjustment shall be made by raising a lever and moving the top clamp vertically.

The bracket system shall be free of straps and clamps that may interfere with auxiliary equipment on SCBA units. The center guide fork shall keep the SCBA tank in place for a safe and comfortable fit in the seat back cavity. The SCBA unit simply needs to be pushed against the pivot arm to engage the patented auto- locking system. Once the lock is engaged, the top clamp shall surround the top of the SCBA tank for a secure fit in all directions.

The SecureAll™ shall include a release handle which shall be integrated into the seat cushion for quick and easy release. This shall eliminate the need for straps or pull cords to interfere with other SCBA equipment.

The seat back shall include a removable padded cover which shall be provided over the SCBA cavity.

### **SEAT MOUNTING FORWARD FACING OUTER**

The forward facing outer seat shall be mounted in the furthest outboard position facing the front of the cab.

### **OCCUPANT PROTECTION FFC**

The forward facing outer seat position(s) shall be equipped with the Occupant Protection System (OPS). The OPS 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 OPS shall also provide ejection mitigation protection.

Each forward facing center seating position APS shall include:

- OPS advanced seatbelt 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 - provides ejection mitigation protection to each occupant in a qualifying event by covering the windows and walls adjacent to crew seating with an airbag custom designed for each cab configuration.

### **Equipment supplied: stowed or installed in this compartment:**

2-Scott Air-Pak X3 w/snap change , standard harness, 5.5 system, EZ-Scape Pro fixed belt, EZ Scape System, 50' t-Safe rope, Crosby hook, F4 descender, standard regulator, Dual EBSS, SEMSII with Bluetooth, 5500 psi / 45 min. carbon fiber cylinder, AV300-HT face piece with Kevlar Head net and right Side Communications bracket.

### **SEAT FRAME FORWARD FACING**

The forward facing outboard seating positions shall include individual enclosed seat frames for each position located and installed at the outer rear wall positions. The seat frames shall measure 21.81 inches wide X 8.63 inches high X 22.00 inches deep. The seat frames shall be constructed of Marine Grade 5052-H32 0.19 inch thick aluminum plate. The seat frames shall be painted with the same color as the remaining interior.

### **SEAT FRAME FORWARD FACING STORAGE ACCESS**

There shall be two (2) access points to this storage area on the front of the seat frame.

### **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 doors shall have a DA Sanded finish.

### **WINDSHIELD WIPER SYSTEM**

The cab shall include a dual arm wiper system which shall clear the windshield of water, ice and debris. There shall be two (2) windshield wipers which shall be affixed to a radial wet arm. The system shall include a single motor which shall initiate the arm in which both the left hand and right hand windshield wipers are attached, initiating a back and forth motion for each wiper. 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 aluminum with a chrome plated 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.

The exterior pull handles shall include a scuff plate behind the handle constructed of polished stainless steel to help protect the cab finish.

### **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 lock out.

### **DOOR LOCK LH REAR CAB COMPARTMENT**

The left hand side rear compartment shall feature a manual door lock.

### **DOOR LOCK RH REAR CAB COMPARTMENT**

The right hand side rear compartment shall feature a manual door lock.

### **GRAB HANDLES**

The cab shall include one (1) 18.00 inch three-piece knurled aluminum, anti-slip exterior assist handle, installed behind each cab door. The assist handle shall be made of extruded aluminum with a knurled finish to enable non-slip assistance with a gloved hand.

### **AUXILIARY GRAB HANDLE**

There shall be a 7.00 inch molded stainless steel grab handle with a bright finish attached to the front fascia of the cab in the center below the windshield. The handle installation shall include a stainless steel scuff plate behind the grab handle to protect the painted surface and a steel reinforcement behind the front cab fascia.

### **SIDVIEW CAB MIRRORS**

Ramco model CRM-310-1750-THCHR-MLED/turn signal bus style mirrors shall be provided. The mirror heads shall be injection molded chrome plated ABS plastic and shall measure 9.50 inches wide X 17.50 inches high. The mirrors shall be mounted one (1) on each the driver and officer doors of the cab with polished die-cast aluminum arms.

The mirrors shall feature an upper heated manual convex glass with a lower heated remote flat glass. The mirror control switches shall be located within easy reach of the driver. The mirrors shall be manufactured using the finest quality non-glare glass and shall feature a rigid mounting thereby reducing vibration. The mirrors shall be corrosion free under all weather conditions. The mirror shall have a turn signal in lower section of mirror.

### **SIDVIEW CAB MIRROR HEAT SWITCH**

The heat for the sideview 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 14 gauge 304 polished stainless steel.

### **MUD FLAPS**

The front wheel wells shall have mud flaps installed on them.

In addition to the chassis supplied front mud flaps, there shall be two (2) mud flaps provided rearward of the rear axles on the apparatus. The mud flaps shall be a minimum of 3/8" thick to prevent "sailing."

**Will furnish section as written: Yes \_\_\_NO\_\_\_Exception #\_\_\_\_\_**

### **BATTERY / 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 31 950 CCA batteries with a 210 minute reserve capacity and 4/0 welding type dual path starter cables per SAE J541.

### **BATTERY TRAY**

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 Black Line-X type liner coating.

The battery trays shall include drain holes in the bottom for sufficient drainage of water. A durable, non-conducting, interlocking mat made by Turtle Tile 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.

### **BATTERY BOX COVER**

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 battery box covers shall also be coated with Line-X type liner black spray on bed liner for additional durability.

### **BATTERY CABLE**

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.

### **BATTERY JUMPER STUD**

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. 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.

### **ALTERNATOR**

The charging system shall include a 360 amp Niehoff 12 C527 volt multi-power alternator. The alternator shall be designed to equally share the vehicle load with a secondary apparatus mounted alternator. The alternator shall include an ignition excited A2-343 external regulator and A9-4045 harness.

### **BATTERY CONDITIONER**

A Kussmaul 1200 battery conditioner shall be supplied. The battery conditioner shall be mounted in the cab in the street side rear facing outer seating position.

### **BATTERY CONDITIONER DISPLAY**

A Kussmaul battery conditioner display shall be supplied. The battery conditioner display shall be mounted in front of the left side door just below the windshield.

### **ELECTRICAL INLET**

A Kussmaul 20 amp electrical receptacle shall be supplied.

A single item or an addition of multiple items must not exceed the rating of the electric inlet that it's connected to.

### **ELECTRICAL INLET LOCATION**

An electrical inlet shall be installed on the street side of the cab ahead of the front door.

### **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**

Two (2) headlamp and combination side marker/turn lamp modules shall be part of the front cab fascia. Each module shall include one (1) rectangular LED high/low beam headlamp.

### **FRONT TURN SIGNALS**

The front fascia shall include two (2) Whelen model 600 4.00 inch X 6.00 inch programmable LED amber turn signals which shall be installed above the headlights.

### **HEADLIGHT LOCATION**

The headlights shall be located on the front fascia of the cab directly above the front warning lights.

### **SIDE TURN/MARKER LIGHTS**

The sides of the cab shall include two (2) LED round side marker lights which shall be provided just behind the front cab radius corners.

### **MARKER AND ICC LIGHTS**

In accordance with FMVSS, there shall be five (5) 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.

### **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.

### **GROUND LIGHTS**

Each door shall include an NFPA compliant 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. The ground lighting shall be activated by the opening of the door on the respective cab side, when the parking brake is set and through a virtual button on the Vista display and control screen.

### **LOWER CAB STEP LIGHTS**

The middle step located at each door shall include a 4.00 inch round Whelen LED recess mounted light which shall activate with the opening of the respective door.

### **INTERMEDIATE STEP LIGHTS**

The intermediate step well area at each door shall include an 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.

### **UNDER BUMPER LIGHTS**

There shall be two (2) 4.00 inch round LED NFPA compliant ground lights mounted under the bumper. The lights shall include a polycarbonate lens, a housing which is vibration welded, and LEDs which shall be shock mounted for extended life. The under bumper ground lighting shall activate with the ground lights.

### **ENGINE COMPARTMENT LIGHT**

There shall be an 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.

### **SIDE SCENE LIGHTS**

The side of the cab shall include two (2) Whelen M6 LED scene lights with chrome bezels, one (1) each side which shall be recess mounted. The Whelen lights shall offer LED lighting at a gradient 32-degree angle. The lamps shall draw 2 amps and generate 1,500 lumens.

### **SIDE SCENE LIGHT LOCATION**

The scene lighting located on the street and curb sides of the cab shall be mounted in the upper forward portion of the cab between the front and rear crew doors.

### **SIDE SCENE ACTIVATION**

The scene lights shall be activated by two (2) virtual buttons on the Vista display and control screen(s), one (1) for each light, and by opening the respective side cab doors.

### **INTERIOR OVERHEAD LIGHTS**

The cab shall include a two-section, red and clear Weldon LED dome lamp located over each door and the engine tunnel. 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.

### **DO NOT MOVE APPARATUS LIGHT**

The front headliner of the cab shall include a flashing red 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 6.00 inches long X 2.50 inches wide X 1.75 inches high and 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.

### **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.

### **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 60BR6FCR ½ RED ½ BLUE Side by side with clear outer lens LED front warning lights with 20 scan-lock flash patterns and independent on/off control in the street and curb inboard positions.. The lights shall be mounted to the front fascia of the cab within a chrome bezel.

## **OUTBOARD FRONT WARNING LIGHTS**

The cab front fascia shall include two (2) Whelen 60BR6FCR ½ RED ½ BLUE Side by side with clear outer lens LED front warning lights with 20 scan-lock flash patterns and independent on/off control in the street and curb outboard positions.. The lights shall be mounted to the front fascia of the cab within a chrome bezel.

## **FRONT WARNING SWITCH**

The front warning lights shall be controlled through a virtual control on the Vista display and control screen. This switch shall be clearly labeled for identification.

## **INTERSECTION WARNING LIGHTS**

The chassis shall include two (2) Whelen 60BR6FCR ½ RED ½ BLUE Side by side with clear outer lens LED front warning lights with 20 scan-lock flash patterns and independent on/off control, one (1) each side.

## **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 60BR6FCR ½ RED ½ BLUE Side by side with clear outer lens LED front warning lights with 20 scan-lock flash patterns and independent on/off control , one (1) on each side. The lights shall be mounted to the sides of the cab within a chrome bezel.

## **SIDE WARNING LIGHTS LOCATION**

The warning light on the street side of the cab shall be mounted over the front wheel well directly over the center of the front axle. The warning light on the curb side of the cab shall be mounted over the front wheel well forward from the center of the front axle.

## **AUXILIARY SIDE WARNING LIGHTS**

The cab sides shall include two (2) Whelen 60BR6FCR ½ RED ½ BLUE Side by side with clear outer lens LED front warning lights with 20 scan-lock flash patterns and independent on/off control , one (1) on each side. The lights shall be mounted to the sides of the cab within a chrome bezel.

## **AUXILIARY SIDE WARNING LIGHTS LOCATION**

The auxiliary warning lights on the side of the cab shall be mounted above the “B” pillar in the highest available position.

## **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.

## **INTERIOR DOOR OPEN WARNING LIGHTS**

The interior of each door shall 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 a warning to oncoming traffic.

## **SIREN CONTROL HEAD**

A Federal EQ2B electronic siren control head shall be provided and installed in the switch panel with a location specific to the customer's needs. The siren shall feature 200-watt output, "Q" wail, yelp, air horn, PA, radio broadcast and "Q" brake. The siren shall include a noise cancelling microphone. The siren shall only operate when the master warning switch is in the on position.

## **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.

## **AIR HORN ACTIVATION**

The air horn activation shall be accomplished through the steering wheel button for the driver and by a single right hand side lanyard cable accessible to the officer. An air horn activation circuit shall be provided to the chassis harness pump panel harness connector.

## **BACK-UP ALARM**

A Preco-Matic model 1059 dual function, dual sound backup alarm shall be installed at the rear of the chassis with an auto-adjusting output level of 87 dB to 112 dB. The alarm shall automatically activate when the transmission is placed in reverse.

**Will furnish section as written: Yes \_\_\_ NO \_\_\_ Exception # \_\_\_\_\_**

## **INSTRUMENTATION**

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.

The instrument panel shall contain the following gauges:

One (1) electronic speedometer shall be included. 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.

One (1) electronic tachometer shall be included. The scale on the tachometer shall read from 0 to 3000 RPM.

One (1) two-movement gauge displaying primary system, and secondary system air volumes and integral LCD odometer/trip odometer shall be included on the lower portion of the LCD. The scale on the air pressure gauges shall read from 0 to 150 pounds per square inch (PSI). The air pressure scales shall be linear to operate with an accuracy of 1 degree of the measured data with a red indication zone on the gauge showing critical levels of air pressure. A red indicator light in the gauge shall indicate a low air pressure, as well as a message on the LCD screen. The odometer shall display up to 9,999,999.9 miles. The trip odometer shall display 9,999.9 miles. The LCD shall display Transmission Temperature in degrees Fahrenheit on the upper portion of the LCD. The LCD screen shall also be capable of displaying certain diagnostic functions.

One (1) four-movement gauge displaying engine oil pressure, coolant temperature, fuel level, voltmeter, and an \*indicator bar displaying Diesel Exhaust Fluid (DEF) LED bar shall be included. The scale on the engine oil pressure gauge shall read from 0 to 120 pounds per square inch (PSI). The engine oil pressure scale shall be linear to operate with an accuracy of 1 degree of the measured. A red indicator light in the gauge shall indicate a low engine oil pressure, as well as a message on the LCD screen. The scale on the coolant temperature gauge shall read from 100 to 250 degrees Fahrenheit (F). The coolant temperature scale shall be linear to operate with an accuracy of 1 degree of the measured data with a red indication zone on the gauge showing critical levels of air pressure. A red indicator light in the gauge shall indicate high coolant temperature, as well as a message on the LCD screen. The scale on the fuel level gauge shall read from empty to full as

a percentage of fuel remaining. An amber indicator light shall indicate low fuel at 25% tank level. The scale on the voltmeter shall read from 10 to 16 volts with a red indication zone on the gauge showing critical levels of battery voltage. A red indicator light shall indicate high or low system voltage, as well as a message on the LCD screen. The scale on the DEF LED bar will consist of four (4) LEDs displaying levels in increments of 25% of useable DEF in green. Upon decreasing levels, the indicator bar will change colors to notify the driver of decreasing levels of DEF and action will be required. An amber indicator light shall indicate low levels of DEF, as well as a message on the LCD screen and an audible alarm.

The instrument panel shall include a light bar that contains the following LED indicator lights and produce the following audible alarms in applicable configurations:

### **RED LAMPS**

Stop Engine-indicates critical engine fault  
Air Filter Restricted-indicates excessive engine air intake restriction  
Park Brake-indicates parking brake is set  
Seat Belt Indicator-indicates when a seat is occupied and corresponding seat belt remains unfastened  
Low Coolant-indicates engine coolant is required

### **AMBER LAMPS**

MIL-indicates an engine emission control system fault  
Check Engine-indicates engine fault  
Check Trans-indicates transmission fault  
High Transmission Temperature-indicates excessive transmission oil temperature  
ABS-indicates anti-lock brake system fault  
HEST-indicates a high exhaust system temperature  
Water in Fuel-indicates presence of water in fuel filter  
\*DPF-indicates a restriction of the diesel particulate filter  
\*Regen Inhibit-indicates regeneration has been postponed due to user interaction  
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-Turn Signal On  
Check Message-Door Ajar  
Check Message-Cab Ajar  
\*Check Message-ESC Active  
\*Check Message-DPF Regen Active  
Check Message-No Engine Data  
Check Message-No Transmission Data  
Check Message-No ABS Data  
Check Message-No Data All Communication With The Vehicle Systems Has Been Lost  
Check Message-Check Engine Oil Level  
Check Message-Check Washer Fluid Level  
Check Message-Check Power Steering Fluid Level  
Check Message-Low Transmission Fluid Level  
Check Message-Check Coolant Level

### **GREEN LAMPS**

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 active  
OK to Pump-indicates the pump engage conditions have been met  
Pump Engaged-indicates the pump is currently in use  
Auxiliary Brake-indicates secondary braking device is active

### **BLUE LAMP**

High Beam Indicator

### **WHITE LAMP**

Wait to Start-indicates active engine air preheat cycle

### **AUDIBLE ALARMS FROM GAUGE PACKAGE**

High Trans Temp  
High or Low Voltage  
Check Engine  
Check Transmission  
Stop Engine  
Low Air Pressure  
Fuel Low  
Water in Fuel  
\*ESC  
High Coolant Temperature  
Low Engine Oil Pressure  
Low Coolant Level  
\*Low DEF Level  
Air Filter Restricted  
Extended Left and Right Turn Remaining On  
Cab Ajar  
Door Ajar  
ABS System Fault  
Seatbelt Indicator

### **EXTERNAL AUDIBLE ALARM**

Air Filter  
Cab Ajar  
Door Ajar  
Check Engine  
Stop Engine  
Low Air Pressure  
Low Engine Oil Pressure  
Water in Fuel  
\*Low DEF  
ABS System Fault  
Seatbelt Indicator  
\*Items marked with an asterisk are provided only in applicable configurations.

### **LCD MESSAGES**

Transmission Temperature  
Battery Voltage  
Engine Hours  
Vehicle Speed  
Engine RPMs  
Fuel Level  
DEF Level  
Engine Oil Pressure  
Ammeter (If quipped)  
Auxiliary Ammeter (If quipped)  
Engine Coolant Temp  
Primary System Air Pressure  
Secondary System Air Pressure  
Turbo Boost Pressure  
Exhaust Temperature  
Engine Load  
Engine Torque  
Instant Fuel Economy  
Average Fuel Economy

### **BACKLIGHTING COLOR**

The instrumentation gauges and the switch panel legends shall be backlit using red LED backlighting.

**Will furnish section as written: Yes \_\_\_ NO \_\_\_ Exception # \_\_\_\_\_**

### **DOOR KEYS**

The cab and chassis shall include a total of four (4) door keys for the manual door locks.

### **FIRE EXTINGUISHER**

A 2.50 pound D.O.T approved fire extinguisher with BC rating shall be shipped loose with the cab.

### **ROAD SAFETY KIT**

The cab and chassis shall include one (1) emergency road safety triangle kit.

### **WARRANTY**

Summary of Warranty Terms:

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.

### **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.

### **CHASSIS OPERATION MANUAL**

There shall be three (3) digital copies of the chassis operation manual provided with the chassis. The digital data shall include a parts list specific to the chassis model and placed on the USB.

### **ENGINE AND TRANSMISSION OPERATION MANUALS**

The following manuals specific to the engine and transmission models ordered will be included with the chassis in the ship loose items:

- (1) Digital copy of the Engine Operation and Maintenance manual (provided on the USB's).
- (1) Digital copy of the Transmission Operator's manual (provided on the USB's).
- (1) Digital copy of the Engine Owner's manual (provided on the USB's).

### **ENGINE SERVICE MANUALS**

There shall be one (1) printed hard copy set of Cummins engine service reference manuals which shall be provided. **This will be provided per contract not per apparatus.** Three (3) digital copies on USB will also be provided per contract.

### **TRANSMISSION SERVICE MANUALS**

There shall be one (1) printed hard copy set of Allison 4000 transmission service manuals shall be included. Three (3) digital copies on USB will also be provided. **This will be provided per contract not per apparatus**

**CAB/CHASSIS AS BUILT WIRING DIAGRAMS**

The cab and chassis shall include two (2) digital copies of wiring schematics and option wiring diagrams.

**Will furnish section as written: Yes \_\_\_NO\_\_\_Exception #\_\_\_\_\_**

**CHASSIS INSPECTION**

There shall be a customer inspection of the chassis at chassis builder's location.

**All expenses for four (4) fire department personnel and one (1) equipment services representative to attend this meeting shall be included in the bid proposal.**

**MEDICAL EQUIPMENT COMPARTMENT BEHIND CAPTIAN'S SEAT**

There shall be a medical equipment compartment behind the Captain's seat starting from the outer wall of the cab. The dimensions shall be approximately 30" tall x 22" wide x 24" deep. Access to this compartment will be through a hinged lid on the top of the compartment. The compartment shall be constructed from aluminum and equipped with On Scene LED lighting. The compartment will house the medical supply bags as indicated below. Final design will be determined at pre-construction.

The compartment shall be coated with gray Line-X coating or equivalent.

**Equipment supplied: stowed or installed in this compartment:**

1-Meret PRB3+PRO Personal Response Bag (TS2 Ready)	1	Cab storage curb side stowed
R & B Cervical collar kit	1	Cab storage curb side stowed

**FOOT LOCKER**

There shall be a foot locker style compartment located behind the engine tunnel in the chassis cab. The compartment shall be approximately 19" tall x 40" wide x 13" deep front to back. Access to the inside storage of the compartment shall be through hinged lid on the top of the storage locker. The compartment shall be constructed from aluminum. The compartment shall be equipped with On Scene LED lighting. The foot locker compartment shall include three (3) dividers within.

The component shall be coated with gray Line-X®, a thermoplastic polyurethane coating.

**Equipment supplied: stowed or installed in this compartment:**

200' CMC Orange ½" kernmantle rope #273210	1	Foot Locker
CMC Stuff bag for above #430201 orange	1	Foot Locker
CMC #300253 carabiners	2	Foot Locker

CMC #370073 carabiners	2	Foot Locker
CMC Water throw bag w/50' rope #291550	1	Foot Locker
Rigid 18 volt impact driver R9602	1	Foot Locker
Dewalt DW2521 driver bit set	1	Foot Locker
Department supplied AED	1	Foot Locker
Meret recover pro O2 5008	1	Foot Locker

**EQUIPMENT CONSOLE ON ENGINE TUNNEL**

There shall be a hinged console located on the center engine tunnel, approximately the same width as the cab doghouse and approximately 4" deep to provide storage underneath. There shall be four cup holders located two each side, one front and one rear of the console. The console shall be painted the same as the cab interior. The console shall be hinged on the front and have gas struts to hold open the console.

**Equipment supplied: stowed or installed in this compartment:**

4-Streamlight 90513 Yellow LED Light

1-Thermal Imaging Camera MSA 6000 with following: 2 – 3 Hour Batteries, Battery for Life, Truck Mount Charger, and Retractable Lanyard

**SHELF BETWEEN FORWARD FACING CREW CAB SEATS**

There shall be a shelf installed between the two outside forward facing seats. The shelf shall be constructed of aluminum and have a Line-X coated finish. Storage shall be provided below the shelf with 12" of free clearance from the floor to the shelf. There shall be restraining webbing installed between the shelf and the floor.

**EQUIPMENT COMPARTMENT**

There shall be an equipment compartment installed in the chassis cab between the forward facing seats. The compartment shall sit on top of a shelf located between the two outside seat risers. The compartment shall be approximately 49" tall (from the shelf to the headliner), 32" wide, and 18" deep. The compartment shall be constructed of aluminum.

The compartment shall have a roll-up door provided on the front for easy access to equipment stored inside. The roll-up door shall be supplied with a full width handle for ease of opening with only one hand, allowing quick access to equipment and Nylon end shoes on every slat to assure operation without constant lubrication.

There shall be a door lock with key provided with the roll-up type door.

The exterior of the compartment shall be covered in Line-X™, a two component spray-in-place thermoplastic polyurethane system used for maximum protection of the body and equipment.

The compartment shall be furnished with an On Scene LED compartment light mounted on the front corner of the compartment. An automatic door switch shall activate the compartment light.

**Equipment supplied: stowed or installed in this compartment:**

Ansul 430847 2.5 gallon water extinguisher	1	Foot Locker
Ansul 431554 20# CO2 extinguisher	1	Foot Locker
Ansul 429011 20# purple K ABC extinguisher	1	Foot Locker
MSA Altair 5x 5 gas monitor	1	Cab storage center left stowed

**Equipment supplied: stowed or installed on this compartment:**

TNT No. TN-635 Fire Tool- street equipment compartment wall panel next to street side seat  
Akron WP-8 Pick head axe-curb side equipment compartment wall panel rear next to curb side seat

**QUIC-MOUNT PIKE POLE BRACKETS**

There shall be two sets of pike pole brackets, Zico Quic-Mount VM-5 located in the chassis cab. Location to be determined at pre-construction.

**Equipment supplied: stowed or installed in this compartment:**

Two (2), Akron Brass 6' Oak Wood Pike Pole item WRO-USA with a standard USA hook shall be provided. The Wood Pike Pole shall be constructed of 1 1/2" red oak handle with the tip sized and tapered and finished with Linseed Oil.

**CUSTOM CENTER FRONT BUMPER STORAGE WELL-21/2" FRONT CROSSLAY**

There shall be a full width storage well provided above the front bumper. The storage well shall be the width of the headlights, with the center area recessed down in between the frame rails. The cover shall be notched to allow for the stored line. Storage well shall have capacity to easily hold 200' of 2 1/2" double jacketed fire line with a pistol grip nozzle. Storage capacity that does not allow for easy re-loading will not be accepted.

**Will furnish section as written: Yes \_\_\_ NO \_\_\_ Exception # \_\_\_\_\_**

**MIDSHIP MOUNT FIRE PUMP**

The pump shall be a Hale 8FG, 3000 GPM fire pump.

**PUMP GEARBOX**

The pump shall have a Hale G series gearbox. The G series gearbox shall be assembled and tested at the pump manufacturer factory. Pump gearbox shall be of sufficient size to withstand up to 16,000 ft. lbs. of torque in road operating conditions. The drive unit shall be designed of ample capacity for lubrication reserve and to maintain the proper operating temperature. The gearbox drive shafts shall be of heat-treated chrome nickel steel and at least 2-3/4 inches in diameter, on both the input and output drive shafts. They shall withstand the full torque of the engine. All pump drive gears shall be of highest quality electric furnace chrome nickel steel. Bores shall be ground to size and teeth integrated, shaved, hardened and ground to give an extremely accurate gear for long life, smooth quiet running, and higher load carrying capability. An accurately cut spur design shall be provided to eliminate all possible end thrust. The pump ratio shall be

selected by the apparatus manufacturer to give maximum performance with the engine and transmission selected. Oil shall be supplied with the pump gearbox.

### **SINGLE STAGE FIRE PUMP**

The pump shall be a single stage centrifugal class "A" rated fire pump, designed specifically for the fire service.

The pump shall be rated at 2250 gallons per minute.

### **PUMP BODY**

The pump body and related parts shall be of fine grain alloy cast iron, with a minimum tensile strength of 30,000 PSI. All moving parts in contact with water shall be of high quality bronze or stainless steel. Pumps utilizing castings made of lower tensile strength cast iron are not acceptable.

The pump body shall be split, on a single plane in two sections for easy removal of the entire impeller assembly, including wear rings and bearings from beneath the pump, without disturbing piping or the mounting of the pump.

### **FIRE PUMP MOUNTING**

The fire pump shall be mounted within a separate body module that is not directly connected to the apparatus body.

The pump shall be frame mounted; therefore minimizing the likelihood of the pump casing cracking should the apparatus be involved in a collision.

The pump module shall be mounted to the frame in four (4) locations and shall be reinforced appropriately in order to carry the expected load for the life of the apparatus.

### **PUMP PRIMED BLACK INTAKES UNPAINTED**

The pump body shall be primed black by the pump manufacturer.

The main intake(s) shall be unpainted and shall be the same color as they arrived from the manufacturer.

Deluge riser(s) external to the body shall be painted to match body color.

### **ALLOY ANODES**

There shall be four (4) Hale alloy anodes provided with the fire pump. The anodes shall aid in preventing galvanic corrosion within the water pump and be easily replaceable. The anodes shall be installed as follows:

- Two (2) in the suction manifold of the fire pump.
- Two (2) in the discharge manifold of the fire pump.

### **IMPELLER**

The pump shall have one (1) double suction impeller. The pump body shall have two (2) opposed discharge volute cutwaters to eliminate radial unbalance.

The pump shaft shall be rigidly supported by three bearings for minimum deflection. One high lead bronze sleeve bearing shall be located immediately adjacent to the impeller. The sleeve bearing shall be lubricated by a force-fed, automatic oil lubricated design, pressure balanced to exclude foreign material. The remaining bearings shall be heavy-duty, deep groove ball bearings in the gearbox and they shall be splash lubricated.

### **MECHANICAL SEAL**

The pump shall be equipped with a mechanical seal. Only one (1) shall be required and it shall be located on the suction (inboard) side of the pump. The mechanical seal shall be two (2) inches in diameter and shall be spring loaded, maintenance free and self-adjusting. Mechanical seal construction shall consist of a carbon sealing ring, stainless steel coil spring, Viton® rubber cup, and a carbide seat with Teflon® backup seal.

### **AIR OPERATED PUMP SHIFT**

The pump shift actuating mechanism shall be air operated from a valve in the cab identified as "PUMP SHIFT". Full instructions for shifting the pump shall be inscribed on the valve plate.

There shall be two (2) green pump system shift indicator lights in the chassis cab. The first light shall become energized when the pump has completed its shift into pump gear and shall be labeled "Pump Engaged". The second light shall become energized when the chassis parking brake has been set and when the pump and the chassis transmissions have been shifted completely into the correct gears for pumping, this light shall be labeled "OK to Pump".

### **MANUAL OVERRIDE PUMP SHIFT**

A manual override system shall be supplied for the pump shift should a problem develop in the chassis air brake system. Controls for the override shall be located at the lower right hand corner of the left side pump panel. Full instructions shall be inscribed on a plate near the pump shift controls.

### **PUMP PRIMING SYSTEM**

There shall be two (2) Hale model ESP, environmentally safe priming pumps included with the pump. Each pump shall be a positive displacement, rotary vane type unit that is self-lubricating, thereby requiring no oil that could leak onto the ground. Each pump shall be controlled from the pump operator's panel. An indicator light on the pump panel shall show when the primer motor is engaged. Each pump shall be capable of creating suction and discharging water from a lift of 10 feet through 20 feet of suction hose of the appropriate size, in not more than 30 seconds starting with the pump dry. It shall be capable of developing a vacuum of 22 inches at an altitude of up to 1000 feet.

### **HALE PVG MANUAL PRIMING VALVE**

There shall be a Hale model PVG, part number 538-0280-52-0 manual primer valve installed on the apparatus.

### **PRESSURE GOVERNOR**

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

The following continuous displays shall be provided:

- Pump discharge; shown with four daylight bright LED digits more than 1/2" high
- Pump Intake; shown with four daylight bright LED digits more than 1/2" high
- Pressure/RPM setting; shown on a dot matrix message display
- Pressure and RPM operating mode LEDs
- Throttle ready LED
- Engine RPM; shown with four daylight bright LED digits more than 1/2" high

- Check engine and stop engine warning LEDs
- Oil pressure; shown on a dual color (green/red) LED bar graph display
- Engine coolant temperature; shown on a dual color (green/red) LED bar graph display
- Transmission Temperature: shown on a dual color (green/red) LED bar graph display
- Battery voltage; shown on a dual color (green/red) LED bar graph display.

The dot-matrix message display shall show diagnostic and warning messages as they occur. It shall show monitored apparatus information, stored data, and program options when selected by the operator. All LED intensity shall be automatically adjusted for day and night time operation.

The program shall store the accumulated operating hours for the pump and engine to be displayed with the push of a button. The kit shall monitor inputs and support audible and visual warning alarms for the following conditions:

- High battery voltage
- Low battery voltage (engine off)
- Low battery voltage (engine running)
- High transmission temperature
- Low engine oil pressure
- High engine coolant temperature
- Out of water (visual alarm only)
- No engine response (visual alarm only).

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

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

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

The pressure governor, monitoring and master pressure display shall be programmed to interface with a specific engine.

There shall be one (1) Boss 400 remote, model PBA400-B00 shall be located on the curb side of the chassis cab.

There shall be one (1) Boss 400 remote, model PBA400-B00 shall be located on the turntable control console to allow control at that location.

## **INTAKE RELIEF VALVE**

There shall be an Elkhart Brass intake relief valve installed on the suction side of the pump. The valve shall be the preset type, adjustable from 75 to 250 PSI, and shall be designed to prevent vibration from altering the setting. The relief outlet shall be directed below the pump with the discharge terminating in a 2-1/2" male NST connection. The discharge shall be away from the pump operator and labeled "Do Not Cap".

### **MASTER DRAIN VALVE**

A Trident manifold drain valve assembly shall be supplied. This drain shall provide the capability to drain the entire pump by turning a single control. The valve assembly shall consist of a stainless steel plate and shaft in a bronze body with multiple ports. The drain valve control shall be mounted on the left side pump panel and labeled "Master Drain".

### **THERMAL RELIEF VALVE WITH INDICATOR LIGHT AND BUZZER**

There shall be a thermal relief valve, model TRV-L120, installed on the pump. The relief valve shall automatically relieve water from the pump when the temperature of the pump water exceeds 120° Fahrenheit. The valve shall automatically reset after activation.

A light and buzzer installed on the pump operator's panel shall indicate when the valve has been activated so the pump operator may take corrective action. A "push to test" button shall be installed beneath the indicator lamp to allow the pump operator to test the lamp.

### **PUMP AND ENGINE COOLING SYSTEM**

There shall be a pump and engine cooling system provided on the apparatus. The cooling system shall keep the engine cool when running for long periods of time and the pump cool during long periods of pumping when water is not being discharged. The cooling system shall also be setup in a way that the cooling system lines can be easily drained through the master pump drain.

The cooling system lines shall consist of high-pressure, high-temperature 3/8" (inside diameter) abraded rubber hose. The engine cooling lines shall be installed with one (1) line going from the discharge side of the water pump through a Class 1, model 38BV, quarter turn ball valve and continuing on to the chassis heat exchanger. The return line from the heat exchanger shall then run into the suction side of the pump. The pump cooling lines shall be installed with one (1) line going from the discharge side of the water pump through a Class 1, model 38BV, quarter-turn ball valve up to the water tank. At the water tank, the pump cooling line shall be plumbed into a 3/8" check valve on the "Tank Fill" valve. The check valve shall prevent tank water from back flowing into the pump when the cooling system is not in use. A return line from the water tank shall be plumbed into the water pump.

The engine cooling system valve shall be controlled on the operator's panel, and shall be clearly labeled, "Engine Cooler".

The pump cooling system valve shall be controlled on operator's panel, and shall be clearly labeled, "Pump Cooler".

### **PUMP MANUALS**

There shall be three (3) Pump Operation and Maintenance manuals provided in USB format with the apparatus.

**Will furnish section as written: Yes \_\_\_NO\_\_\_Exception # \_\_\_\_\_**

### **FOAM SYSTEM**

There shall be a FoamPro 2002 single foam system installed on the apparatus. The system shall be an electronic, fully automatic, variable speed, direct injection, and discharge side foam proportioning system. The system shall be capable of handling Class A foam concentrates and most Class B foam concentrates. The foam proportioning operation shall be based on direct measurement of water flows, and remain consistent within the specified flows and pressures. The system shall be equipped with a digital electronic control display, suitable for installation on the pump panel. Incorporated within the control display shall be a microprocessor that receives input from the system flow meter, while also monitoring foam

concentrate pump output, comparing values to ensure that the operator preset proportional amount of foam concentrate is injected into the discharge side of the fire pump.

A paddlewheel type flow meter shall be installed in a manifold for the specified foam capable discharges.

The digital computer control display shall enable the pump operator to perform the following control and operation functions for the foam proportioning system:

- Provide push-button control of foam proportioning rates from 0.1% to 9.9% in 0.1% increments.
- Show current gallon-per-minute water flow rate.
- Show total gallons of water discharged, during and after foam operations are completed.
- Show total gallons of foam concentrate consumed.
- Simulate flow rates for manual operation.
- Perform set-up and diagnostic functions for the computer control microprocessor.
- Flash a "low concentrate" warning when the foam concentrate tank(s) run(s) low.
- Flash a "no concentrate" warning and shut the foam concentrate pump off, preventing damage to the pump, should the foam tank(s) empty.

A 12 volt electric motor driven positive displacement foam concentrate pump, rated up to 5 GPM (18.9 L/min), with operating pressures up to 400 PSI (27.6 BAR), shall be installed in a suitable compartment near the apparatus pump house. A pump motor electronic driver (mounted to the base of the pump) shall receive signals from the computer control display, and power the 3/4 horsepower electric motor directly coupled to the concentrate pump in a variable speed duty cycle to ensure that the correct proportion of concentrate preset by the pump operator is injected into the water stream.

System capacity shall be as follows:

Foam Concentrate	Maximum Water Flow	GPM (L/Min)	0.2%	2500 (9464)	0.5%	1000 (3785)	1.0%	500 (1893)	3.0%	166 (628)
------------------	--------------------	-------------	------	-------------	------	-------------	------	------------	------	-----------

A full flow check valve shall be provided to prevent foam contamination of fire pump and water tank or water contamination of foam tank.

Components of the complete proportioning system as described above shall include:

- Operator control and display
- One (1) Paddlewheel flow meter
- Pump and electric motor/motor driven
- Wiring harnesses
- Foam injection check valve
- One (1) low-level foam tank switch
- Three (3) installation and operation manuals, in the USB format, shall be provided for the unit, along with a one (1) year limited warranty. A system-schematic placard and a system-rating placard shall be supplied and installed in accordance with NFPA standards.

Class "B" foam shall be utilized.

A single foam flush system shall be installed to provide a clean water flush of the foam concentrate pump preventing foam concentrates from mixing and possible jelling. Clean water from the booster tank shall be plumbed to a 1/4 turn valve located on the pump panel. The valve shall be capable of operating pressures to 500 psi.

**Will furnish section as written: Yes \_\_\_NO\_\_\_Exception # \_\_\_\_\_**

### **CUSTOM PLUMBING MANIFOLD**

The plumbing manifold shall be a custom design that includes the inlet side manifold and the discharge side manifold. Galvanized Victaulic couplings shall be used wherever possible for ease of maintenance and superior corrosion protection.

The inlet side of the plumbing manifold shall utilize schedule 10, 304 grade stainless steel tubing and preformed elbows for inlets that are larger than 3". Side auxiliary inlets that are 3" or smaller shall utilize schedule 40, 304 grade stainless steel tubing and preformed elbows. The inlet manifold shall thread into the pump auxiliary inlet ports and each inlet valve shall thread onto the inlet manifold.

The discharge side of the plumbing manifold shall utilize schedule 10, 304 grade stainless steel tubing and preformed elbows. The discharge manifold shall connect to the pump discharge ports using 1/2" stainless steel flanges that shall be machined to seat an O-ring to ensure a leak proof seal. Each discharge shall derive from a port on the manifold assembly connected to a discharge valve with 1/2" 304 grade stainless steel flanges. Discharges that terminate in a location other than the pump module (i.e. rear discharges) shall utilize a combination of high pressure flex hose and schedule 10, 304 grade stainless steel tubing to allow flexibility between the body and the pump module.

### **4" TANK-TO-PUMP**

There shall be a 4" tank-to-pump plumbed with a Class 1 flexible hose from the tank to the suction side of the pump.

An Akron Brass model 8840 4" Swing™ valve shall be provided. The valve shall have an all brass body with flow optimizing stainless steel ball and dual polymer seats. The valve shall be capable of dual directional flow while incorporating a specially designed flow optimizing stainless steel ball. The valve shall not require lubrication of seats or any other internal waterway parts, and must be capable of swinging out of the waterway for maintenance by the removal of six bolts. The valve shall be manufactured and assembled in the United States. The valve shall carry a ten (10) year warranty by the valve manufacturer.

The valve shall be actuated by an Akron Brass electric actuator installed on the valve. The electric actuator shall have a 16:1 gear ratio, which actuates from fully open to fully closed in five (5) seconds, a clutchless motor, and utilize an electric controller with current limiting design.

The electric actuated valve shall be controlled through the Pump Control System.

There shall be a check valve between the pump suction and the booster tank valve. The check valve shall eliminate back flow into the water tank when the pump is connected to a pressurized source.

### **2" TANK FILL**

There shall be a 2" tank fill plumbed from the pump to the tank. Installation shall be completed with 2" Class 1 rubber hose and stainless steel hose couplings.

An Akron Brass model 8620 2" Swing-Out™ valve shall be provided. The valve shall have an all brass body with flow optimizing stainless steel ball and dual polymer seats. The valve shall be capable of dual directional flow while incorporating a specially designed flow optimizing stainless steel ball. The valve shall not require lubrication of seats or any other internal waterway parts, and must be capable of swinging out of the waterway for maintenance by the removal of six bolts. The valve shall carry a ten (10) year warranty by the valve manufacturer.

The valve shall be actuated by an Akron Brass electric actuator installed directly on the valve. The electric actuator shall have a 16:1 gear ratio, which actuates from fully open to fully closed in five (5) seconds, a clutchless motor, and utilize an electric controller with current limiting design.

The electric actuated valve shall be controlled through the Pump Control System.

### **5" RIGHT SIDE STEAMER INLET #1**

There shall be a 5" steamer inlet located on the right side of the pump module. The suction fittings shall include a removable die-cast screen to provide cathodic protection for the pump thus reducing corrosion.

A short steamer barrel shall be installed to accommodate an intake valve without exceeding the legal overall body width.

The steamer inlet shall terminate in MNH thread.

There shall be one (1) TFT, AXE1SP-NT-RC, 5" Female NH x 4" Storz low profile ball intake valve provided. The ball intake valve RC is an electric remote controlled valve. A large hand wheel is installed on the drive shaft for manual override. The TFT YE-CAN1 multiplex interface shall be provided to permit the ball intake valve to be controlled thru the Pump Control system. .

The electric actuated valve shall be controlled through the Pump Control System. The display shall show valve position indication.

There shall be one (1) TFT model A01SP, 4" Storz blind cap with lanyard provided.

There shall be a two (2) piece permanent plate installed that includes a verbiage tag and a black color coded bezel. The verbiage tag shall be etched on aluminum and have 3M-468 adhesive applied to the back for assembly into the bezel. The bezel shall be die cast aluminum construction and color coded on all visible surfaces with an automotive grade paint. 3M VHB adhesive shall be applied to the back.

### **6" CURB SIDE STEAMER INLET #2**

There shall be a 6" steamer inlet located on the curb side of the pump module. The suction fittings shall include a removable die-cast screen to provide cathodic protection for the pump thus reducing corrosion.

A short steamer barrel shall be installed to accommodate an intake valve without exceeding the legal overall body width.

The steamer inlet shall terminate in MNH thread.

There shall be one (1) TFT, AXE1SP-NX-RC, 6" Female NH x 4" Storz low profile ball intake valve provided. The ball intake valve RC is an electric remote controlled valve. A large hand wheel is installed on the drive shaft for manual override. The TFT YE-CAN1 multiplex interface shall be provide to permit the ball intake valve to be controlled thru the Pump Control System.

The electric actuated valve shall be controlled through the Pump Control System. The display shall show valve position indication.

There shall be one (1) TFT model A01SP, 4" Storz blind cap with lanyard provided.

There shall be a two (2) piece permanent plate installed that includes a verbiage tag and a black color coded bezel. The verbiage tag shall be etched on aluminum and have 3M-468 adhesive applied to the back for assembly into the bezel. The bezel shall be die cast aluminum construction and color coded on all visible surfaces with an automotive grade paint. 3M VHB adhesive shall be applied to the back.

### **6" CURB SIDE STEAMER INLET #3**

There shall be a 6" steamer inlet located on the right side of the pump module. The suction fittings shall include a removable die-cast screen to provide cathodic protection for the pump thus reducing corrosion.

A short steamer barrel shall be installed to accommodate an intake valve without exceeding the legal overall body width.

The steamer inlet shall terminate in MNH thread.

There shall be one (1) TFT, AXE1SP-NX-RC, 6" Female NH x 4" Storz low profile ball intake valve provided. The ball intake valve RC is an electric remote controlled valve. A large hand wheel is installed on the drive shaft for manual override. The TFT YE-CAN1 multiplex interface shall be provide to permit the ball intake valve to be controlled thru the pump control system.

The electric actuated valve shall be controlled through the Pump Control System. The display shall show valve position indication.

There shall be one (1) TFT model A01SP, 4" Storz blind cap with lanyard provided.

There shall be a two (2) piece permanent plate installed that includes a verbiage tag and a chrome color coded bezel. The verbiage tag shall be etched on aluminum and have 3M-468 adhesive applied to the back for assembly into the bezel. The bezel shall be die cast aluminum construction and color coded on all visible surfaces with an automotive grade paint. 3M VHB adhesive shall be applied to the back.

### **DISCHARGE DRAINS**

There shall be an Innovative Control 3/4" quarter turn drain valve included on each discharge. There shall be a side stem, long stroke chrome plated lift handle provided on the drain valve to facilitate use with a gloved hand. The drain valve shall have a verbiage tag that angles upward so that it can easily be seen and read by the operator before opening. The drain valve shall be located just above the running board and below the pump panel to reduce clutter in the pump panel area. The drain valve shall be connected to the valve with flexible hose that is routed in such a manner as to assure complete drainage to below the apparatus. A matching color bezel shall be included for each drain.

### **5" RIGHT SIDE DISCHARGE #1**

There shall be a 5" large diameter discharge, with 4" plumbing, located on the curb side of the pump module.

An Akron Brass model 8840 4" Swing-Out™ valve shall be provided. The valve shall have an all cast brass valve body with a 4" full flow waterway ideal for flows up to 2000gpm and a maximum body length of 4". The valve shall utilize a bronze flat ball design with a single urethane seat and be structurally rated to 500psi with a 250psi operating pressure. The valve shall not require the lubrication of seats or any other internal waterway parts, and shall be capable of swinging out of the waterway for maintenance by the removal of six bolts. The valve shall carry a ten (10) year warranty by the valve manufacturer.

The valve shall be actuated by an Akron Brass electric actuator installed on the valve. The electric actuator shall have a 25:1 gear ratio, which actuates from fully open to fully close in eight (8) seconds, a clutchless motor, and utilize an electric controller with current limiting design.

The electric actuated valve shall be controlled through the Pump Control System. The display shall show pressure and flow as well as valve position indication. The pressure display shall be programmed to PSI.

The discharge shall terminate MNH thread.

There shall be one (1) Task Force Tips model # AH3SP-NT 30 degree elbow provided. For corrosion resistance, the elbow shall be constructed of hardcoat anodized aluminum alloy, have a silver powder coat finish inside and out and include a polymer bearing ring for prevention of galvanic corrosion. The elbow shall be configured with a 4" swivel Storz coupling and a 5" female NH swivel rocker lug coupling.

There shall be one (1) Kochek model S36S425, 4" Storz x 2-1/2" Male NH rigid adapter provided. The adapter shall be light weight aluminum with a black K-Coat finish.

There shall be one (1) South Park model HCC2808AC, 2-1/2" NST vented rocker lug cap with chain provided. The cap shall be manufactured from high quality brass that shall be polished to remove manufacturing irregularities with a chrome finish applied to the polished surface.

There shall be a two (2) piece permanent plate installed that includes a verbiage tag and a dark green color coded bezel. The verbiage tag shall be etched on aluminum and have 3M-468 adhesive applied to the back for assembly into the bezel. The bezel shall be die cast aluminum construction and color coded on all visible surfaces with an automotive grade paint. 3M VHB adhesive shall be applied to the back.

### **2-1/2" CURB SIDE DISCHARGE #2**

There shall be a 2-1/2" discharge, with 2-1/2" plumbing, located on the right side of the pump module.

An Akron Brass model 8625 2 1/2" Swing-Out™ valve shall be provided. The valve shall have an all brass body with flow optimizing stainless steel ball and dual polymer seats. The valve shall be capable of dual directional flow while incorporating a specially designed flow optimizing stainless steel ball. The valve shall not require lubrication of seats or any other internal waterway parts, and must be capable of swinging out of the waterway for maintenance by the removal of six bolts. The valve shall carry a ten (10) year warranty by the valve manufacturer.

The valve shall be actuated by an Akron Brass electric actuator installed directly on the valve. The electric actuator shall have a 16:1 gear ratio, which actuates from fully open to fully closed in five (5) seconds, a clutchless motor, and utilize an electric controller with current limiting design.

The electric actuated valve shall be controlled through the Pump Control System. The display shall show pressure and flow as well as valve position indication. The pressure display shall be programmed to PSI.

The discharge shall terminate MNST thread.

There shall be one (1) South Park model SE394505AC, 2-1/2" Female NST swivel rocker lug x 2-1/2" Male NST 45° elbow adapter provided. The adapter shall be manufactured from high quality brass and the swivel shall be attached using ball bearings. The adapter shall be polished to remove manufacturing irregularities with a chrome finish applied to the polished surface.

There shall be one (1) South Park model HCC2808AC, 2-1/2" NST vented rocker lug cap with chain provided. The cap shall be manufactured from high quality brass that shall be polished to remove manufacturing irregularities with a chrome finish applied to the polished surface.

There shall be a two (2) piece permanent plate installed that includes a verbiage tag and a orange color coded bezel. The verbiage tag shall be etched on aluminum and have 3M-468 adhesive applied to the back for assembly into the bezel. The bezel shall be die cast aluminum construction and color coded on all visible surfaces with an automotive grade paint. 3M VHB adhesive shall be applied to the back.

### **5" CURB SIDE DISCHARGE #3**

There shall be a 5" large diameter discharge, with 4" plumbing, located on the curb side of the pump module.

An Akron Brass model 8840 4" Swing-Out™ valve shall be provided. The valve shall have an all cast brass valve body with a 4" full flow waterway ideal for flows up to 2000gpm and a maximum body length of 4". The valve shall utilize a bronze flat ball design with a single urethane seat and be structurally rated to 500psi with a 250psi operating pressure. The valve shall not require the lubrication of seats or any other internal waterway parts, and shall be capable of swinging out of the waterway for maintenance by the removal of six bolts. The valve shall carry a ten (10) year warranty by the valve manufacturer.

The valve shall be actuated by an Akron Brass electric actuator installed on the valve. The electric actuator shall have a 25:1 gear ratio, which actuates from fully open to fully close in eight (8) seconds, a clutchless motor, and utilize an electric controller with current limiting design.

The electric actuated valve shall be controlled through the Pump Control System. The display shall show pressure and flow as well as valve position indication. The pressure display shall be programmed to PSI.

The discharge shall terminate MNH thread.

There shall be one (1) Task Force Tips model # AH3SP-NT 30 degree elbow provided. For corrosion resistance, the elbow shall be constructed of hardcoat anodized aluminum alloy, have a silver powder coat finish inside and out and include a polymer bearing ring for prevention of galvanic corrosion. The elbow shall be configured with a 4" swivel Storz coupling and a 5" female NH swivel rocker lug coupling.

There shall be one (1) Kochek model S36S425, 4" Storz x 2-1/2" Male NH rigid adapter provided. The adapter shall be light weight aluminum with a black K-Coat finish.

There shall be one (1) South Park model HCC2808AC, 2-1/2" NST vented rocker lug cap with chain provided. The cap shall be manufactured from high quality brass that shall be polished to remove manufacturing irregularities with a chrome finish applied to the polished surface..

There shall be a two (2) piece permanent plate installed that includes a verbiage tag and a dark green color coded bezel. The verbiage tag shall be etched on aluminum and have 3M-468 adhesive applied to the back for assembly into the bezel. The bezel shall be die cast aluminum construction and color coded on all visible surfaces with an automotive grade paint. 3M VHB adhesive shall be applied to the back.

## **2-1/2" FRONT BUMPER DISCHARGE**

### **Equipment supplied: stowed or installed in this compartment:**

Akron 4836 2 1/2" High Range Assault Break apart nozzle with pistol grip.

4-All American Supreme – 50' x 2 1/2" Tan Hose. Thread shall be NH on 2 1/2" Couplings. On the female couplings shall be stamped "STLFD"

There shall be a 2-1/2" discharge located inside the center hosewell of the front bumper. The discharge shall be plumbed with 2-1/2" plumbing and high pressure flex hose with stainless steel couplings.

The discharge shall have Class1 model 34AD automatic drains installed in the low routed areas below the 1/4 turn manual drain. The automatic drains shall open whenever pressure in the line drops below 6 psi.

An Akron Brass model 8625 2-1/2" Swing-Out™ valve shall be provided. The valve shall have an all brass body with flow optimizing stainless steel ball and dual polymer seats. The valve shall be capable of dual directional flow while incorporating a specially designed flow optimizing stainless steel ball. The valve shall not require lubrication of seats or any other internal waterway parts, and must be capable of swinging out of the waterway for maintenance by the removal of six bolts. The valve shall carry a ten (10) year warranty by the valve manufacturer.

The valve shall be actuated by an Akron Brass electric actuator installed directly on the valve. The electric actuator shall have a 16:1 gear ratio, which actuates from fully open to fully closed in five (5) seconds, a clutchless motor, and utilize an electric controller with current limiting design.

The electric actuated valve shall be controlled through the Pump Control System. The display shall show pressure and flow as well as valve position indication. The pressure display shall be programmed to PSI.

The discharge shall terminate MNH thread.

The discharge shall be designated as a pre-connect and no cap and chain shall be supplied.

There shall be a two (2) piece permanent plate installed that includes a verbiage tag and a black color coded bezel. The verbiage tag shall be etched on aluminum and have 3M-468 adhesive applied to the back for assembly into the bezel. The bezel shall be die cast aluminum construction and color coded on all visible surfaces with an automotive grade paint. 3M VHB adhesive shall be applied to the back.

## **2" REAR PRECONNECT #1**

**Equipment supplied: stowed or installed in this compartment:**

Akron 4836 2 1/2" High Range Assault Break apart nozzle with pistol grip.

4-All American Supreme – 50' x 2" Tan Hose. Thread shall be NH on 2 1/2" Couplings. On the female couplings shall be stamped "STLFD"

There shall be a 2" discharge located in the rear bumper of the apparatus.

An Akron Brass model 8620 2" Swing-Out™ valve shall be provided. The valve shall have an all brass body with flow optimizing stainless steel ball and dual polymer seats. The valve shall be capable of dual directional flow while incorporating a specially designed flow optimizing stainless steel ball. The valve shall not require lubrication of seats or any other internal waterway parts, and must be capable of swinging out of the waterway for maintenance by the removal of six bolts. The valve shall carry a ten (10) year warranty by the valve manufacturer.

The valve shall be actuated by an Akron Brass electric actuator installed directly on the valve. The electric actuator shall have a 16:1 gear ratio, which actuates from fully open to fully closed in five (5) seconds, a clutchless motor, and utilize an electric controller with current limiting design.

The electric actuated valve shall be controlled through the Pump Control System. The display shall show pressure and flow as well as valve position indication. The pressure display shall be programmed to PSI.

The discharge shall terminate in 2 1/2" MNH thread.

The discharge shall be designated as a pre-connect and no cap and chain shall be supplied.

There shall be a two (2) piece permanent plate installed that includes a verbiage tag and a white color coded bezel. The verbiage tag shall be etched on aluminum and have 3M-468 adhesive applied to the back for assembly into the bezel. The bezel shall be die cast aluminum construction and color coded on all visible surfaces with an automotive grade paint. 3M VHB adhesive shall be applied to the back.

**Will furnish section as written: Yes \_\_\_NO\_\_\_Exception # \_\_\_\_\_**

## **1-1/2" REAR PRECONNECT #2**

**Equipment supplied: stowed or installed in this compartment:**

Akron 4865 Mid-Range Assault Breakapart Nozzle with Pistol Grip

4-All American Supreme – 50' x 1 3/4" Tan Hose. Thread shall be NH on 1 1/2" Couplings. On the female couplings shall be stamped "STLFD"

There shall be a 1-1/2" discharge located in the rear bumper of the apparatus.

An Akron Brass model 8620 2" Swing-Out™ valve shall be provided. The valve shall have an all brass body with flow optimizing stainless steel ball and dual polymer seats. The valve shall be capable of dual directional flow while incorporating a specially designed flow optimizing stainless steel ball. The valve shall not require lubrication of seats or any other internal waterway parts, and must be capable of swinging out of the waterway for maintenance by the removal of six bolts. The valve shall carry a ten (10) year warranty by the valve manufacturer.

The valve shall be actuated by an Akron Brass electric actuator installed directly on the valve. The electric actuator shall have a 16:1 gear ratio, which actuates from fully open to fully closed in five (5) seconds, a clutchless motor, and utilize an electric controller with current limiting design.

The electric actuated valve shall be controlled through the Pump Control System. The display shall show pressure and flow as well as valve position indication. The pressure display shall be programmed to PSI.

The discharge shall terminate MNH thread.

The discharge shall be designated as a pre-connect and no cap and chain shall be supplied.

There shall be a two (2) piece permanent plate installed that includes a verbiage tag and a yellow color coded bezel. The verbiage tag shall be etched on aluminum and have 3M-468 adhesive applied to the back for assembly into the bezel. The bezel shall be die cast aluminum construction and color coded on all visible surfaces with an automotive grade paint. 3M VHB adhesive shall be applied to the back.

#### **4" DELUGE RISER DISCHARGE-REAR**

There shall be a 4" discharge for the deluge located above the rear of the body. The discharge shall be located above the rear center compartment.

An Akron Brass model 8840 4" Swing-Out™ valve shall be provided. The valve shall have an all cast brass valve body with a 4" full flow waterway ideal for flows up to 2000gpm and a maximum body length of 4". The valve shall utilize a Fusion CFT™ composite ball design with a single urethane seat and be structurally rated to 500psi with a 250psi operating pressure. The valve shall not require the lubrication of seats or any other internal waterway parts, and shall be capable of swinging out of the waterway for maintenance by the removal of six bolts. The valve shall carry a ten (10) year warranty by the valve manufacturer.

The valve shall be actuated by an Akron Brass electric actuator installed on the valve. The electric actuator shall have a 25:1 gear ratio, which actuates from fully open to fully close in eight (8) seconds, a clutchless motor, and utilize an electric controller with current limiting design.

The electric actuated valve shall be controlled through the Pump Control System. The display shall show pressure and flow as well as valve position indication. The pressure display shall be programmed to PSI.

There shall be a two (2) piece permanent plate installed that includes a verbiage tag and a black color coded bezel. The verbiage tag shall be etched on aluminum and have 3M-468 adhesive applied to the back for assembly into the bezel. The bezel shall be die cast aluminum construction and color coded on all visible surfaces with an automotive grade paint. 3M VHB adhesive shall be applied to the back.

**Will furnish section as written: Yes \_\_\_ NO \_\_\_ Exception # \_\_\_\_\_**

#### **DECK GUN RISER PIPE**

There shall be a TFT XGA48VP-RP "Extend-a-Gun" riser pipe attached to the deck gun riser pipe.

### **TFTY4-EP1A MONITOR**

There shall be one (1) **TFTY4-EP1A Monsoon 2000 RC Monitor** provided with the curb side deluge.

There shall be one (1) **TFT M-ERP2000-NM Master 2000 RC nozzle with multi-Pressure Control 80-120psi**,

There shall be a two (2) piece permanent plate installed that includes a verbiage tag and a magenta color coded bezel. The verbiage tag shall be etched on aluminum and have 3M-468 adhesive applied to the back for assembly into the bezel. The bezel shall be die cast aluminum construction and color coded on all visible surfaces with an automotive grade paint. 3M VHB adhesive shall be applied to the back.

**Will furnish section as written: Yes \_\_\_ NO \_\_\_ Exception # \_\_\_\_\_**

### **BOOSTER REEL**

There shall be a Hannay model SBEPF24-28-29 steel fabricated electric rewind booster reel, with a capacity of 250' of 1" booster hose, installed on the apparatus. An automatic brake and an auxiliary manual rewind crank shall be supplied.

The booster reel shall be mounted in the rear of the body above the EHL.

An Akron Brass model 8620 2" Swing-Out™ valve shall be provided. The valve shall have an all brass body with flow optimizing stainless steel ball and dual polymer seats. The valve shall be capable of dual directional flow while incorporating a specially designed flow optimizing stainless steel ball. The valve shall not require lubrication of seats or any other internal waterway parts, and must be capable of swinging out of the waterway for maintenance by the removal of six bolts. The valve shall carry a ten (10) year warranty by the valve manufacturer.

The valve shall be actuated by an Akron Brass electric actuator installed directly on the valve. The electric actuator shall have a 16:1 gear ratio, which actuates from fully open to fully closed in five (5) seconds, a clutchless motor, and utilize an electric controller with current limiting design.

The electric actuated valve shall be controlled through the Pump Control System. The display shall show pressure and flow as well as valve position indication. The pressure display shall be programmed to PSI.

The booster reel shall be painted Hannay silver.

There shall be one (1) section of 200' x 1" and one (1) section of 50' 800 lb. test booster hose coupled with 1" NST pyrolite couplings installed on the booster reel.

There shall be a rubber covered push button switch located on the rear of the apparatus body for the rewind control of the reel.

There shall be a two (2) piece permanent plate installed that includes a verbiage tag and a tan color coded bezel. The verbiage tag shall be etched on aluminum and have 3M-468 adhesive applied to the back for assembly into the bezel. The bezel shall be die cast aluminum construction and color coded on all visible surfaces with an automotive grade paint. 3M VHB adhesive shall be applied to the back.

There shall be an Elkhart Brass nozzle clip provided. The clip is designed to hold either a round or elliptical shape with dimensions of 1-1/2" to 1-3/4".

### **Equipment supplied, stowed or installed in this compartment:**

<b>TFT BH-BGT Impulse booster nozzle</b>	<b>1</b>	<b>Booster Reel</b>
--	----------	---------------------

200' sections of 800# tested booster hose with 1" NST pyrolite coupling	2	Booster Reel
50' sections of 800# tested booster hose with 1" NST pyrolite coupling	1	Booster Reel

## **WATER TANK**

The apparatus shall be equipped with a United Plastic Fabricating 500 U.S. gallon rectangular water tank. Certification of the tank capacity shall be recorded on the manufacturer's record of construction and shall be provided to the purchaser upon delivery of the apparatus. The UPF® water tank shall be constructed of 1/2" thick PT2E™ polypropylene sheet stock. This material shall be a non-corrosive stress relieved thermoplastic, black in color, and U.V. stabilized for maximum protection.

### **BOOSTER TANK**

The booster tank shall be of a specific configuration and shall be so designed to be completely independent of the body and compartments. All joints and seams shall be nitrogen welded and tested for maximum strength and integrity. The top of the booster tank shall be fitted with removable lifting eyes designed with a 3 to 1 safety factor to facilitate easy removal.

### **TANK BAFFLES**

The transverse swash partitions shall be manufactured of 3/8" PT2E™ polypropylene (natural in color) and extend from approximately 4" off the floor to just under the cover. The longitudinal swash partitions shall be constructed of 3/8" PT2E polypropylene (natural in color) and extend to the floor of the tank through the cover to allow for positive welding and maximum integrity. All partitions shall be equipped with vent and air holes to permit movement of air and water between compartments. The partitions shall be designed to provide maximum water flow. All swash partitions shall interlock with one another and be welded to each other as well as to the walls of the tank.

### **TANK SUMP**

There shall be one (1) sump in the bottom of the water tank. The sump shall be constructed of 1/2" polypropylene and shall be located in the left front quarter of the tank. On all tanks that require a front suction, a 4" schedule 40 polypropylene pipe shall be installed that will incorporate a dip tube from the front of the tank to the sump location. The sump shall be used as a combination clean-out and drain. All tanks shall have an anti-swirl plate located approximately 2" above the sump to pre-vent air from being entrained in the water while pumping.

### **TANK FILL CONNECTION**

All tank fill couplings shall be backed with flow deflectors to break up the stream of water entering the tank, and shall be capable of withstanding sustained fill rates of up to 1,000 GPM.

### **TANK LID**

The tank lid shall be constructed of 1/2" thick PT2E™ polypropylene to incorporate a multi three-piece locking design that allows for individual removal and inspection if necessary. The tank lid shall be recessed 3/8" from the top of the tank and shall be welded to both sides and longitudinal partitions for maximum integrity. Each one of the lids shall have hold downs consisting of 2" polypropylene dowels spaced a maximum of 30" apart. These dowels shall extend through the covers and shall assist in keeping the covers rigid under fast filling conditions. A minimum of two lifting dowels shall be drilled and tapped 1/2" x 13" to accommodate the lifting eyes

### **WATER TANK MOUNTING**

The water tank cradle shall be designed specifically for this apparatus. The cradle structure shall be supported by and welded directly to the top plate of the torque-box.

### **WATER TANK DRAIN**

There shall be a 1-1/2" drain valve provided under the sump of the water tank. The valve shall include a locking lever to prevent accidental draining of the water tank.

#### WATER TANK FILL TOWER

The tank shall have a combination vent and manual fill tower marked "Water Fill." The fill tower shall be constructed of 1/2" PT2E™ polypropylene and shall be a minimum dimension of 8" x 8" at the outer perimeter. The tower shall be located in the left front corner of the tank. The tower shall have a 1/4" thick removable polypropylene screen and a PT2E™ polypropylene hinged-type cover. The fill tower shall be blue in color.

#### 4" WATER TANK OVERFLOW

The tank shall be equipped with a minimum of a 4" schedule 40 polypropylene overflow/air vent pipe. The pipe shall be installed in the fill tower and extend through the tank and dump to the rear of the rear axle.

#### WATER TANK LEVEL GAUGE

There shall be one (1) Fire Research TankVision™ model WLA300-A00 water tank level gauge provided on the pump operator's control panel. The kit shall include an electronic indicator module, a pressure sensor, and a 10' sensor cable. The indicator shall show the volume of water in the tank on nine (9) easy to see super bright LEDs. The display shall use a 2 dimensional 2-element lens to refract the light from the LEDs to provide full 180° visibility for the level indication. The gauge shall start to flash when the tank volume is at 1/4 tank or less and use down scrolling LEDs to alert the pump operator when the tank is almost empty.

**Will furnish section as written: Yes \_\_\_NO\_\_\_Exception # \_\_\_\_\_**

#### FOAM CELL

There shall be one (1) United Plastic Fabricating 30 U.S. gallon foam cell incorporated into the water tank. There shall be one (1) pressure/vacuum vent installed on the foam tank. There shall be one (1) drain hose connected to the foam cell. The drain shall have a quarter-turn valve installed inside the pump module and it shall drain below the frame rail of the chassis.

The foam tank shall have a manual fill tower. The fill tower shall be constructed of 1/2" PT3™ polypropylene and shall be a minimum dimension of 8" x 8" outer perimeter. The foam fill tower shall be constructed of a green colored material indicating which tower is to receive each foam. The capacity of the tank shall be engraved on the top of the fill tower lid. The tower shall be located in the right front corner of the tank unless otherwise specified. The tower shall have a 1/4" thick removable polypropylene screen and a stainless steel hinged-type cover. Inside the fill tower, approximately 1.5" down from the top, there shall be an anti-foam fill tube that extends down to the bottom of the tank. A pressure vacuum vent shall be provided in the lid of the fill tower.

Class "B" foam shall be utilized.

#### FOAM TANK LEVEL GAUGE

There shall be one (1) Fire Research TankVision™ model WLA370-A00 class B foam tank level gauge provided. The gauge shall be located on the pump operators control panel and shall have a label that indicates it is for the foam cell. The gauge shall have 9 super bright LEDs to show the tank volume. The display shall use a 2 dimensional, 2-element lens to refract the light from the LEDs to provide full 180° visibility for the level indication. The gauge shall use a pressure transducer installed near the bottom of the foam tank to determine the correct volume in the tank. The gauge shall be self-calibrating by filling the tank at a steady flow rate. Self-diagnostics capabilities shall be standard on the gauge. The gauge shall start to flash when the tank volume is at 1/4 tank or less and use down scrolling LEDs to alert the pump operator when the tank is almost empty.



- Fire Research INControl TGA400 series pressure governor
- The PV780T and pressure governor will be in a stacked orientation, with the governor being located above the PV780T.

The PV780T is a 7 inch, full color LCD display, with (14) buttons and touch screen capability with (2) J1939 CAN Bus connections and one (1) NTSC/PAL video inputs at each remote-mounting location. It shall be bonded for direct sunlight viewing, sealed to IP67 and mounted in the flush position.

The PV780T's switches shall be set to act as momentary, maintained or three-way switches without any physical hardware change. All switches and or indicators may be configured as touch screen inputs into the multiplex system. The (14) buttons are blue LED backlit. Upon power-up, the display offers the user the ability to select one of four common scenarios (that can be custom configured based on departmental needs). If the user wishes not to use a pre-configured scenario screen, they can choose to access either of the two main valve screens by touching a screen link.

The PowerView Display shall be programmed for operations that include but are not limited to:

- Pump operation information
  - Discharge and intake valve operation
  - Control of the electric monitor
  - Water tank and foam tank levels
  - Additional components utilizing CAN-BUS controller when available
- Each panel shall be plugged into the valve network.

### **STATIONARY DRIVER'S SIDE PUMP PANEL**

There shall be components requiring stationary locations on the driver's side pump panel that will not be located at the other Pump Control locations at the turntable and officer's side cab. The stationary panel shall have items that include but are not limited to:

- Test Ports
- Warning Labels
- Data Plates
- Additional external controller required

The stationary street side pump panel shall be Line-X coated.

The stationary panel in the curb side of the mid cab shall have the secondary Pump Control panel.

### **SIDE PUMP PANEL, AND CURB SIDE MID CAB PANEL**

The side pump panels and curb side mid cab panel shall be coated with black Line-X® for maximum resistance to abrasion and to minimize glare. The material shall be capable of withstanding the effects of extreme temperatures and weather.

### **PUMP PANEL LIGHTS**

The pump operator's control panel and the curb side pump panel shall each be illuminated by On-Scene LED Night Axe lighting. The pump panel lights shall become energized upon setting the parking brake so the gauge information provided may be consulted at any time the apparatus is parked. A stainless steel shield shall be installed over the pump panel lights to further protect them from the elements and to act as a reflector for additional illumination.

### **PRESSURE AND VACUUM TEST PORT**

There shall be a Class1 model 121384 pressure and vacuum test port provided on the pump panel.

### **DISCHARGE TRIM PLATES**

Each gated discharge shall have a chrome plated die cast zinc trim plate around the discharge valve and fitting. The trim plate shall be easily removable without the need to disturb the valve.

### **STREET SIDE RUNNING BOARD**

A modular bolt-on running board shall be installed on the side of the pump module. The running board shall be constructed of anti-slip tread plate. The outside edge of the running board shall be flush with the rub rail that is installed on the body to maintain a uniform appearance. The running board shall be installed with sufficient support to form a sturdy, non-deflecting step area for personnel.

### **CURB SIDE RUNNING BOARD**

A modular bolt-on running board shall be installed on the side of the pump module. The running board shall be constructed of anti-slip tread plate. There shall be a soft suction hose well compartment recessed in the running board. The floor of the compartment shall be covered with Turtle Tile flooring. The outside edge of the running board shall be flush with the rub rail that is installed on the body to maintain a uniform appearance. The running board shall be installed with sufficient support to form a sturdy, non-deflecting step area for personnel.

### **STORAGE WELL STRAPS**

There shall be two (2) Pac Trac model 1008 straps provided with the storage well. The straps shall be installed over the top of the compartment to retain the hose.

### **CROSSLAY CONFIGURATION**

There shall be two (2) crosslay pre-connects located in the extended rear bumper. Class1 high-pressure flex hose with stainless steel couplings shall be used in the plumbing.

A Trident 90° swivel elbow shall be utilized to keep the hose from kinking when pulled from either side of the apparatus. The swivel for each crosslay shall be located outboard for ease of making connections while changing hose.

### **CROSSLAY #1 CAPACITY**

The 2" crosslay shall have a capacity of 250' of 2" double jacket fire hose.

The hose shall be double stacked.

### **CROSSLAY #2 CAPACITY**

The 1-1/2" crosslay shall have a capacity of 250' of 1/3/4" double jacket fire hose.

The hose shall be double stacked.

The color of the vinyl restraint shall be black.

### **CROSSLAY COVER**

There shall be a bi-fold aluminum non-slip tread plate cover installed on the crosslay hose bed. The cover shall not interfere with hose loading when in the open position. The cover shall be provided with two full length stainless steel piano style hinges that shall attach the cover to the body and allow it to bi-fold. The cover shall be light yet rigid. Opening of the cover may be performed by one person on one side of the apparatus and yet the cover shall be rigid enough to support weight without deformation.

Vertical stainless steel rollers shall be provided on the rear body corners at each end of the crosslay hose bed to facilitate deployment of hose without the hose getting caught between the rear bumper and the body. The rollers shall extend from the top deck of the rear bumper and integrated into the bottom of the handrails.

The interior of the crosslay hose bed shall have a maintenance free abraded finish. The floor of the crosslay shall be slotted sufficiently for drainage.

The crosslay cover shall have weatherstripping to keep water from getting into the hosebeds. This should include around the edges and over the hinge area on the entire cover.

**Will furnish section as written: Yes \_\_\_NO\_\_\_Exception #\_\_\_\_\_**

**FRONT PUMP ACCESS PANEL**

There shall be a tread plate access panel provided on the front of the pump compartment. The panel shall be of the single pan design and shall be positively latched in the closed position utilizing a push button latch. An aluminum sill protector shall be installed on the bottom of the door opening to protect the paint from chipping and scratching. This area shall be accessible when the cab is tilted.

**TOP PUMP ACCESS PANEL**

There shall be a tread plate access panel provided on top of the pump compartment. The panel shall be of the single pan design and shall utilize pop latches to secure it in place.

**STREET SIDE APU ACCESS PANEL**

There shall be a bolt-on painted aluminum panel on the upper portion of the left side of the pump module to allow access to the APU. The panel shall be of the single pan design and shall be secured utilizing stainless steel fasteners. The panel shall have a high-definition precision cuts of an area as large as possible on the panel to allow proper air flow.

**CURB SIDE APU ACCESS PANEL**

There shall be a bolt-on painted aluminum panel on the upper portion of the right side of the pump module to allow access to the APU. The panel shall be of the single pan design and shall be secured utilizing stainless steel fasteners. The panel shall have a high-definition precision cuts of an area as large as possible on the panel to allow proper air flow.

**Will furnish section as written: Yes \_\_\_NO\_\_\_Exception #\_\_\_\_\_**

**HOSE FITTING STORAGE COMPARTMENT STREET SIDE PANEL**

There shall be a storage compartment located just above the running board on the left side pump operator's panel. The storage compartment shall have a vertically hinged door constructed of tread plate with compression latches. The compartment shall have a Line-X coated removable plate space off the rear wall for the mounting of hose coupling. The compartment shall be wired to the open door warning light system. The compartment shall contain an On Scene Solutions light. Compartment shall be of a water resistant design.

**Equipment supplied, stowed or installed in this compartment:**

Akron 535 2.5" Cellar Nozzle	1	Pump appliance locker
Akron 2581 2.5" x (2) 1.5" Gated Wye	1	Pump Appliance locker
Red Head 36 2.5" Double Male	1	Pump Appliance locker
Red Head 35 2.5" Double Female	1	Pump Appliance locker
Red Head 37 2.5" to 1.5" Reducer	1	Pump Appliance Locker
Red Head S54R425 4" Storz to 2.5" rocker lug female	1	Pump Appliance Locker

Red Head S60S54 5" Storz to 4" Stortz Adapter	1	Pump Appliance Locker
Red Head KS34 Combo w/ four 4"-2.5" spanners	1	Pump Appliance Locker
Red Head 37R115 1.5" MNST x 1" female (CHT)	1	Pump Appliance Locker
Akron Style 25 Booster spanner wrenches	1	Pump Appliance Locker
Akron No. 448 Bracket w/two Style 10 Spanner Wrenches	1	Pump Appliance Locker

**AUXILLARY STEP ABOVE STREET SIDE PUMP PANEL**

There shall be a step provided on the left side of the apparatus above the pump panel. The step shall be a minimum of 8" deep and the width of the pump panel and be formed from aluminum anti-slip tread plate. The step shall have a grab rail incorporated into the outer edge of the stepping surface.

**AUXILLARY STEP ABOVE CURB SIDE PUMP PANEL**

There shall be a step provided on the right side of the apparatus above the pump panel. The step shall be a minimum of 8" deep x the width of the pump panel and be formed from aluminum anti-slip tread plate. The step shall have a grab rail incorporated into the outer edge of the stepping surface.

**Will furnish section as written: Yes \_\_\_NO\_\_\_Exception # \_\_\_\_\_**

**ALUMINUM BODY CONSTRUCTION**

The apparatus body shall be fabricated from 1/8" 5052-H32, smooth aluminum sheet. The total outside width of the apparatus body shall not exceed 100 inches (2.54 meters). The width measurement of the sidewalls shall be made from the outside wall of the two opposite sides of the body.

The complete apparatus body shall be fabricated utilizing the break and bend techniques in order to form a strong, yet flexible, uni-body structure. The body shall be constructed with holding fixtures to ensure proper dimensioning. Each apparatus body is specific in design in order to meet the unique requirements of the purchasing fire department.

The main body compartments on each side, as well as the rear center compartment if applicable, shall contain a sweep out floor design. Each compartment shall be made to the most practical dimensions in order to provide maximum storage capacity for the fire department's equipment. The door opening threshold shall be positioned lower than the compartment floor permitting easy cleaning of the compartments.

Continuous, solid welded seams shall be located at the upper front and upper rear corners of the apparatus body. The flooring of all lower, main body compartmentation shall also have solid weld seams. All door jams, on both the top and the bottom, shall be solid welded as well. Each main door jamb shall consist of a double jamb design; this is comparable to a double struck frame design, which provides superior strength and durability. All double door jams are to be welded together utilizing the plug weld technique. All remaining compartment walls shall be stitch welded.

The compartment floors, specifically L1 and R1, shall have a minimum of two (2) 1" x 2" rectangular tubes welded to the entire width of the compartment floor. The two (2) rear side compartments as well as the rear center compartment, if applicable, shall be welded to the rear deck support structure. This rear deck support structure is specially designed for the galvanized apparatus body substructure. A minimum of two (2) squares tubes, which are 1/4" x 3" x 3", shall run the entire width of the body from sidewall to sidewall. Each lower, rear compartment shall be adequately stitch welded to the cross tubes providing strength and durability to the entire apparatus body.

The body design shall include a "false wall" design in the lower portion of each lower, rear compartment. This "false wall" is required in order to allow for easy accessibility to the rear electrical components found in the rear tail light cluster area.

On the upper area of the apparatus body, directly above the side compartment door openings, a header is to be fabricated from smooth, aluminum sheet. This area shall be free from any body seams and shall be painted the same color as the apparatus body. The height of the header may vary depending on the following factors: apparatus design, lettering requirements, scene lights and warning light requirements as well as various other options. A "J" channel shall be incorporated into the body design in order to provide a rain gutter to further assist in preventing excessive moisture from getting into the compartments.

**Will furnish section as written: Yes \_\_\_NO\_\_\_Exception # \_\_\_\_\_**

### **ULTRA STAINLESS™ STEEL FASTENERS**

Ultra Stainless™ steel fasteners shall be provided for all exposed and unpainted fasteners throughout the body in locations such as overlays, pump panels, and other numerous hardware mounting locations. The special ingredient in Ultra Stainless™ is Marutex®, which adds 2% molybdenum (moly) to 410 stainless. Moly is the significant component of 316 stainless that provides extra corrosion resistance. The moly is now added to 410 self drilling screws to produce Ultra Stainless™. This combination provides for unprecedented corrosion resistance combined with hardness for drilling.

### **Turtle Tile**

There shall be Turtle Tile Plastics interlocking squares in all of the body compartments. The Turtle Tiles shall be applied in all body compartment shelves, adjustable-height trays, floor-mounted trays and on compartment floors that do not contain floor-mounted trays. No turtle Tiles shall be applied on compartment floors underneath floor mounted trays. Each square shall be made from polyvinyl chloride that is flame and chemical resistant. For maximum slip resistance and drainage, each square shall have a grid surface design.

### **ADDITIONAL HARDWARE**

There shall be a bag of stainless steel nuts, bolts, and washers supplied with the apparatus for mounting of equipment.

**Will furnish section as written: Yes \_\_\_NO\_\_\_Exception # \_\_\_\_\_**

### **BODY SUB FRAME**

To assure proper body alignment and clearance, the body sub frame shall be constructed in a jig and fitted directly on the chassis. The sub frame shall be constructed of 36,000 PSI galvanized steel.

The chassis frame rails shall be fitted with fiber reinforced rubber to isolate the body frame members from direct contact with chassis frame rails.

The main body sub frame shall be constructed from steel tubing. The sub frame shall run the full length of the body and shall be spaced the same width as the chassis frame rails. The main sub frame shall also be the integral support for the water tank. Vertical drop tubes shall be welded to the sub frame. From these vertical drop tubes shall extend cross members constructed of steel angle. These cross members shall extend out to support the compartments. Cross members shall be located at the front and rear of the body and in front and rear of the wheel well opening.

A drop frame, fabricated of steel tube and steel angles, shall support the compartment area behind the rear. The rear drop frame shall be constructed using vertical drop tubes, welded to the main sub frame. All drop frame structures shall be welded directly to the body sub frame to allow the body to be a completely separate structure from the chassis.

After fabrication the sub frame shall be hot dip galvanized for maximum protection against corrosion.

### **BODY MOUNTING**

The body sub frame shall be fastened to the chassis frame with a minimum of six (6) spring loaded body mounts. Each mount shall be configured using a two-piece bracket. The two (2) brackets shall be fabricated of steel plates. The plates shall be galvanized to prevent any corrosion. Each mounting assembly shall utilize two (2) plated bolts and two (2) heavy duty springs. The assembly design shall allow the body and sub frame to act as one (1) component, separate from the chassis. As the chassis frame twists under driving conditions, the spring mounting system shall limit any stress from being transferred into the body. The spring loaded body mounts shall also prevent frame side rail or body damage caused by unevenly distributed stress and strains due to load and chassis movement.

Body mountings that do not allow relief from chassis movement shall not be acceptable.

### **TANK MOUNTING**

The water tank shall rest on the sub frame cross members which are spaced as required by the tank manufacturer.

The tank shall be isolated from the cross members through the use of hard rubber strips with a minimum Rockwell hardness of 60 durometer. Additionally, the tank shall be supported around the entire perimeter and captured front and rear as well as side to side to prevent the tank from shifting during vehicle operations.

Although the tank shall be designed on a free floating suspension principle, it shall be required that the tank have adequate hold down restrains to minimize movement during vehicle operations.

The tank shall be completely removable without disturbing or dismantling the apparatus structure.

### **EXHAUST HEAT DEFLECTOR SHIELD**

There shall be a 5" heat deflector shield installed over the exhaust to aid in dissipating the heat to prevent exhaust heat from adversely affecting anything stored in the body.

**Will furnish section as written: Yes \_\_\_ NO \_\_\_ Exception # \_\_\_\_\_**

### **STREET SIDE BODY CONFIGURATION**

#### COMPARTMENT S1

There shall be a full height compartment located ahead of the rear wheels on the left side of the apparatus body. This compartment shall be designated as S1 within these specifications and any ensuing paperwork or drawings after contract execution.

- Door Opening 48.00" wide x 59.50" high
- Usable Depth 25.75"

There shall be one (1) ROM rollup door installed on the compartment face. The door shall be a shutter type with 34 millimeter slats that roll onto a spool at the top of the compartment. Each slat shall be equipped with nylon end shoes to assure operation without the need of constant lubrication. The door slats shall be wet painted by the door manufacturer to match the apparatus body.

The ROM rollup door shall be supplied with a full width lift bar and finger pull handle integrated into the bottom rail for easy one hand operation.

The compartment shall have two (2), 48" ROM V4 LED compartment lights installed. Each light shall feature solid state construction and be waterproof to IPX7 rating. Each V4 LED light shall offer 250 lumens per foot of lighting.

There shall be four (4) aluminum strut channels, two (2) per side, welded in the full depth, full height compartment.

There shall be one (1), aluminum adjustable shelf installed on the apparatus in the full depth compartment. The shelf shall be constructed of 3/16" aluminum sheet with 2" lips. The shelf shall have a Line-X® finish and shall be designed in such a manner as to allow liquids to readily drain when spilled.

There shall be a roll out tray installed on the floor of the compartment. The tray shall be provided with a SlideMaster™ model SM3-LP roller type assembly. The roller assembly shall have a rated capacity of 300 lb. distributed load and have 100% extension capability. A mechanical lock assembly shall be provided to lock the tray in the extended or retracted position. The tray shall be constructed of 3/16" aluminum sheet with 3" lips and shall have an abraded finish. The tray roller assembly shall have a powder coated finish for added corrosion protection.

There shall be one (1) permanent vertical partition installed in the standard height compartment. The partition shall match the compartment interior.

**Equipment supplied, stowed or installed in this compartment:**

Husqvarna 970 power saw w/ Fire hooks 12" chopper blade	1	S-1 upper stowed
Fire hooks 12" Chopper blade	1	S-1 upper
Dessert Diamond 14" diamond blade	1	S-1 upper
Tool kit for saw	1	S-1 upper stowed
1 gallon storage can for mineral oil	1	S-1 upper stowed
1 gallon gasoline safety can	1	S-1 upper stowed
Turtle Tile mall cribbing kit	1	S-1 upper
Amkus Extended reach tips	1	S-1 upper
1 gallon storage can for mineral oil	1	S-1 upper stowed
1 gallon gasoline safety can	1	S-1 upper stowed
Amkus RAM Accessory Kit	1	C-1 upper stowed

**Lower**

Amkus AMK-24 Spreader w/mounts	1	S-1 Tray
Amkus AMK-21A Cutter w/ mounts	1	S-1 Tray
Amkus AMK-20R RAM	1	S-1 Tray
Amkus GH2B-MCH mini simo power unit	1	S-1 Tray
Amkus 20' extension hose red quick coupling	1	S-1 Tray

**Will furnish section as written: Yes \_\_\_ NO \_\_\_ Exception # \_\_\_\_\_****COMPARTMENT S2**

There shall be a standard height compartment located above the rear wheels on the left side of the apparatus body. This compartment shall be designated as S2 within these specifications and any ensuing paperwork or drawings after contract execution.

- Door Opening 56.00" wide x 28.00" high
- Usable Depth 25.75"

There shall be one (1) ROM rollup door installed on the compartment face. The door shall be a shutter type with 34 millimeter slats that roll onto a spool at the top of the compartment. Each slat shall be equipped with nylon end shoes to assure operation without the need of constant lubrication. The door slats shall be wet painted by the door manufacturer to match the apparatus body.

The ROM rollup door shall be supplied with a full width lift bar and finger pull handle integrated into the bottom rail for easy one hand operation.

The compartment shall have two (2), 12" ROM V4 LED compartment lights installed. Each light shall feature solid state construction and be waterproof to IPX7 rating. Each V4 LED light shall offer 250 lumens per foot of lighting.

There shall be four (4) aluminum strut channels, two (2) per side, welded in the full depth compartment.

There shall be one (1), tilt down roll out tray installed on the apparatus. The tray shall be provided with an Innovative Industries roller type assembly, model SMT. The roller assembly shall be bolted to vertical struts to allow for height adjustment of the tray. The roller assembly shall have a rated capacity of 250 lb. distributed load, have 90% extension capability, and a 30 degree tilt down capability. A mechanical lock assembly shall be provided to lock the tray in the extended position and the retracted position. The tray shall be constructed of 3/16" aluminum sheet with 3" lips and shall be coated with Line-X®, a thermoplastic polyurethane coating. The tray roller assembly shall have a powder coated finish for added corrosion protection.

There shall be one (1) splash guard/drip pan installed inside the compartment. The aluminum drip pan shall catch drops of water that accumulate on the shutter and drip into the shutter compartment when the door is being rolled up. The plastic splash guard shall act to keep water from being splashed throughout the interior of the compartment while the door is being rolled up. The pan shall also serve to protect the shutter from damage due to impact from behind or below.

**Equipment supplied, stowed or installed in this compartment:**

Sears Craftsman D handle scoop shovel	1	S-2 mounted
Unger UNG FP60C Squeegee w/pro handle	1	S-2 mounted
Sears Craftsman round point shovel w/D handle	1	S-2 mounted
NuWay 1424-24" Prime Stiff Fiber Garage Broom	2	S-2 mounted
NuWay 1 1/8" x 60" Metal Threaded handle	2	S-2 mounted
Akron 4824 w/350gpm@100psi baffle with 2390 Play pipe	1	S-2 mounted
Akron 3443 Monitor w/4445 fixed w/bracket	1	S-2 mounted

Akron 3488 Stream Shaper (2-1/2" x 2-1/2") 1 S-2 mounted

Akron 2499 Deluge Tips 1 set S-2 mounted

**Will furnish section as written: Yes \_\_\_NO\_\_\_Exception # \_\_\_\_\_**

**COMPARTMENT S3**

There shall be a full height compartment located behind the rear wheels on the left side of the apparatus body. This compartment shall be designated as S3 within these specifications and any ensuing paperwork or drawings after contract execution.

- Door Opening 36.00" wide x 59.50" high
- Usable Depth 25.75"

There shall be one (1) ROM rollup door installed on the compartment face. The door shall be a shutter type with 34 millimeter slats that roll onto a spool at the top of the compartment. Each slat shall be equipped with nylon end shoes to assure operation without the need of constant lubrication. The door slats shall be wet painted by the door manufacturer to match the apparatus body.

The ROM rollup door shall be supplied with a full width lift bar and finger pull handle integrated into the bottom rail for easy one hand operation.

The compartment shall have one (1), 48" ROM V4 LED compartment light installed. The light shall feature solid state construction and be waterproof to IPX7 rating. The V4 LED light shall offer 250 lumens per foot of lighting.

There shall be four (4) aluminum strut channels, two (2) per side, welded in the full depth, full height compartment.

There shall be one (1), aluminum adjustable shelf installed on the apparatus in the full depth compartment. The shelf shall be constructed of 3/16" aluminum sheet with 2" lips. The shelf shall have a Line-X® finish and shall be designed in such a manner as to allow liquids to readily drain when spilled.

There shall be one (1) splash guard/drip pan installed inside the compartment. The aluminum drip pan shall catch drops of water that accumulate on the shutter and drip into the shutter compartment when the door is being rolled up. The plastic splash guard shall act to keep water from being splashed throughout the interior of the compartment while the door is being rolled up. The pan shall also serve to protect the shutter from damage due to impact from behind or below.

**Equipment supplied, stowed or installed in this compartment:**

Igloo 3 gallon cooler	1	S-3 stowed
1-set (4) Lighted collapsible traffic cones	4	S-3 stowed
Foam Appliance, Task Force Tips, UM-12	1	S-3
Mounting bracket for above	1	S-3
Super Vac #720GC Gas powered fan	1	S-1 lower stowed

**Will furnish section as written: Yes \_\_\_NO\_\_\_Exception # \_\_\_\_\_**

**CURB SIDE BODY CONFIGURATION**

**COMPARTMENT C1**

There shall be a full height compartment located ahead of the rear wheels on the right side of the apparatus body. This compartment shall be designated as C1 within these specifications and any ensuing paperwork or drawings after contract execution.

- Door Opening 48.00" wide x 59.50" high
- Usable Depth 25.75" lower and 13.25" upper
- Intermediate divide height 26.50"

There shall be one (1) ROM rollup door installed on the compartment face. The door shall be a shutter type with 34 millimeter slats that roll onto a spool at the top of the compartment. Each slat shall be equipped with nylon end shoes to assure operation without the need of constant lubrication. The door slats shall be wet painted by the door manufacturer to match the apparatus body.

The ROM rollup door shall be supplied with a full width lift bar and finger pull handle integrated into the bottom rail for easy one hand operation.

The compartment shall have two (2), 48" ROM V4 LED compartment lights installed. Each light shall feature solid state construction and be waterproof to IPX7 rating. Each V4 LED light shall offer 250 lumens per foot of lighting.

There shall be four (4) aluminum strut channels, two (2) per side, welded in the full depth, full height compartment.

There shall be one (1), aluminum adjustable shelf installed on the apparatus in the full depth compartment. The shelf shall be constructed of 3/16" aluminum sheet with 2" lips. The shelf shall have a Line-X® finish and shall be designed in such a manner as to allow liquids to readily drain when spilled.

There shall be a roll out tray installed on the floor of the compartment. The tray shall be provided with a SlideMaster™ model SM3-LP roller type assembly. The roller assembly shall have a rated capacity of 300 lb. distributed load and have 100% extension capability. A mechanical lock assembly shall be provided to lock the tray in the extended or retracted position. The tray shall be constructed of 3/16" aluminum sheet with 3" lips and shall have an abraded finish. The tray roller assembly shall have a powder coated finish for added corrosion protection.

There shall be one (1) splash guard/drip pan installed inside the compartment. The aluminum drip pan shall catch drops of water that accumulate on the shutter and drip into the shutter compartment when the door is being rolled up. The plastic splash guard shall act to keep water from being splashed throughout the interior of the compartment while the door is being rolled up. The pan shall also serve to protect the shutter from damage due to impact from behind or below.

**Equipment supplied, stowed or installed in this compartment:**

**Upper Shelf**

1- Streamlight 44551 Vulcan LED Light 1 C-1 upper

Sears Tool box 1 C-1 stowed

**Tools provided in tool box**

14" aluminum pipe wrench 2 C-1

Sears Craftsman standard pliers 1 C-1

Klein Linemans pliers 9" 1 C-1

Crescent 10" adjustable wrench 2 C-1

Vise Grip 10" plier 1 C-1

24 oz. Eastwing claw hammer	1	C-1
Standard medium screwdriver	1	C-1
Phillips screwdriver #2	1	C-1
Hack saw	1	C-1
Key hole saw	1	C-1
Channel Lock pliers	1	C-1
Akron ELSS-XLAC-PLMT portable light w/WG & SW	1	C-1 stowed

**Lower shelf cont'd**

Akron ECRP-10-ELSS-XLAC 100' 12/3 cord and gang box	1	C-1 stowed
Akron 25' shoreline cord w/20amp female twistlock	1	C-1 stowed
Akron 12" pig tail 20 amp male twistlock to female house	1	C-1 hanger
Akron 12" pig tail 20 amp male house to female twistlock	1	C-1 hanger
Super Vac #720VR2 Electric powered fan	1	C-1 stowed
Super Vac #200SE Smoke Ejector	1	stowed

**Will furnish section as written: Yes \_\_\_NO\_\_\_Exception # \_\_\_\_\_**

**COMPARTMENT C2**

There shall be a standard height compartment located above the rear wheels on the right side of the apparatus body. This compartment shall be designated as C2 within these specifications and any ensuing paperwork or drawings after contract execution.

- Door Opening 56.00" wide x 28.00" high
- Usable Depth 13.25"

There shall be one (1) ROM rollup door installed on the compartment face. The door shall be a shutter type with 34 millimeter slats that roll onto a spool at the top of the compartment. Each slat shall be equipped with nylon end shoes to assure operation without the need of constant lubrication. The door slats shall be wet painted by the door manufacturer to match the apparatus body.

The ROM rollup door shall be supplied with a full width lift bar and finger pull handle integrated into the bottom rail for easy one hand operation.

The compartment shall have two (2), 12" ROM V4 LED compartment lights installed. Each light shall feature solid state construction and be waterproof to IPX7 rating. Each V4 LED light shall offer 250 lumens per foot of lighting.

There shall be one (1) splash guard/drip pan installed inside the compartment. The aluminum drip pan shall catch drops of water that accumulate on the shutter and drip into the shutter compartment when the door is being rolled up. The plastic splash guard shall act to keep water from being splashed throughout the interior of the compartment while the door is being rolled up. The pan shall also serve to protect the shutter from damage due to impact from behind or below.

There shall be one (1) aluminum mounting plate installed on the back wall of the compartment. The plate shall be spaced away from the back wall of the compartment with uni-strut channels which shall also be used as an easy means of removing the plate to mount equipment brackets. The plate shall be constructed of 3/16", 5052-H32 aluminum and have an Line-X® finish.

**Equipment supplied, stowed or installed in this compartment:**

Fire Hooks "Maximus" halligan w/Pigg axe married pair	1	C-2 mounted
McMaster – Car 5333T56 Electrical gloves	1	C-2 stowed
Leather protective gloves #13785T16	1	C-2 stowed
Glove bag for above #9645T	1	C-2 stowed
CMC 150' New England ½" Multiline II rope	1	C-2 stowed
CMC stuff bag for rope #430205 black	1	C-2 stowed
36" Gooseneck wrecking bar	1	C-3
Akron FSY-12 12 pound sledge hammer	1	C-3
Akron PPB-51 pry bar	2	C-3
HK Porter 18" 0090 MC bolt cutter	1	C-3
HK Porter 36" 390MC bolt cutter	1	C-3

**Will furnish section as written: Yes \_\_\_ NO \_\_\_ Exception # \_\_\_\_\_**

**COMPARTMENT C3**

There shall be a full height compartment located behind the rear wheels on the right side of the apparatus body. This compartment shall be designated as C3 within these specifications and any ensuing paperwork or drawings after contract execution.

- Door Opening 36.00" wide x 59.50" high
- Usable Depth 25.75" lower and 13.25" upper
- Intermediate divide height 26.50"

There shall be one (1) ROM rollup door installed on the compartment face. The door shall be a shutter type with 34 millimeter slats that roll onto a spool at the top of the compartment. Each slat shall be equipped with nylon end shoes to assure operation without the need of constant lubrication. The door slats shall be wet painted by the door manufacturer to match the apparatus body.

The ROM rollup door shall be supplied with a full width lift bar and finger pull handle integrated into the bottom rail for easy one hand operation.

The compartment shall have one (1), 48" ROM V4 LED compartment light installed. The light shall feature solid state construction and be waterproof to IPX7 rating. The V4 LED light shall offer 250 lumens per foot of lighting.

There shall be four (4) aluminum strut channels, two (2) per side, welded in the full depth, full height compartment.

There shall be one (1), aluminum adjustable shelf installed on the apparatus in the full depth compartment. The shelf shall be constructed of 3/16" aluminum sheet with 2" lips. The shelf shall have a Line-X® finish and shall be designed in such a manner as to allow liquids to readily drain when spilled.

There shall be one (1) splash guard/drip pan installed inside the compartment. The aluminum drip pan shall catch drops of water that accumulate on the shutter and drip into the shutter compartment when the door is being rolled up. The plastic splash guard shall act to keep water from being splashed throughout the interior of the compartment while the door is being rolled up. The pan shall also serve to protect the shutter from damage due to impact from behind or below.

**Equipment supplied, stowed or installed in this compartment:**

**Upper**

Fire Innovations ladder belts	4	C-3 upper
Milwaukee M/S AB Strap High rise bag	1	Bag for below
Task Force AY5NJ-NJ 2.5" In Line gauge w/swivel	1	High rise bag
Shot gun sprinkler stop	2	High rise bag
Task Force 2.5" x 2.5" Gated Wye	1	High rise bag
Akron 583 Hose roller	1	High rise bag
CMC 50' New England 3/8" Multiline (hose roller)	1	attached to above
Akron 78 Ladder Strap	2	High rise bag

**Lower**

Light weight highrise line 2"on 2-1/2" couplings 100' red	1	High rise pack
Light weight highrise line 2" on 2 1/2" couplings 50' red	2	High rise pack
Light weight highrise 2 1/2' line on 2 1/2" couplings 50' red	1	High rise pack
Akron 2431 Saber Shutoff with 15/16" orifice	1	High rise pack
Akron 4866 1.5" tip w/spinning teeth 175gpm @ 75 psi	1	High rise pack
Akron 4836 2.5" Assault b/ a tip with pistol grip 250gpm @75psi	1	High rise pack
Model BB065 high rise straps	3	High rise pack

**REAR BODY CONFIGURATION**

**REAR COMPARTMENT**

There shall be a compartment located at the rear of the apparatus that extends into the apparatus torque box.

There shall be one (1) horizontally hinged lap type compartment door installed on the compartment face. The lap door shall be a single panel construction and fabricated of smooth plate aluminum. The edges of the door shall be formed to an

inward angle for added rigidity. There shall be rubber molding installed in the overlap area of the door to insure a weatherproof seal and prevent water from collecting in the door sill. The compartment door shall have a polished stainless steel continuous hinge with a rubber seal installed between the hinge and the aluminum door to separate the dissimilar metals. The hinge pin shall be stainless steel with a minimum diameter of 1/4".

The compartment door handle shall be a non locking stainless steel grab handle.

There shall be two (2) pressurized gas-filled cylinders furnished on the compartment door. The cylinders shall hold the door in the open position and assist in raising it. The gas filled cylinders shall assist in closing the door automatically when the door is positioned over center.

The compartment shall be adequately lite for nighttime operations.

### **COMPARTMENT AIR RELEASE**

Each compartment shall be vented to help remove trapped air when closing a compartment door. The vent shall be a rubber gasket in the area of the outboard corners of the compartment. Wiring may also be run through these areas.

### **COMPARTMENT DRAIN HOLES**

Each body compartment shall be equipped with drain holes to allow standing water to exit to underneath the apparatus.

### **WALKWAYS AND OVERLAYS**

All exterior surfaces designated by the manufacturer as stepping, standing, or walking areas shall be overlaid with 3003 H22 Bright Tread Plate to provide a slip resistant surface, even when the surface is wet. All interior surfaces designated by the manufacturer as stepping, standing, or walking areas shall be slip resistant when the surface is dry. The degree of slip resistance shall be in compliance with the intent of NFPA 1901.

Horizontal walkways shall have .080" aluminum tread plate overlays installed and vertical surfaces shall have .125" aluminum overlays. Overlays shall be installed that are totally insulated from the apparatus with nylon shoulder washers that extend into holes in the body. Stainless steel cap nuts shall be employed where bolt ends may damage equipment or cause injury. After the apparatus is painted and the overlays are reinstalled, they shall be additionally sealed at the edges with a caulking compound. The exterior top tread plate overlay shall be mounted flush with the outer edges of the apparatus body.

### **STEPPING SURFACES**

All steps shall have a surface area of at least 35 square inches and shall be able to withstand a load of at least 500 pounds. Steps shall be provided at any area that personnel may need to climb and shall be adequately lighted.

**Will furnish section as written: Yes \_\_\_NO\_\_\_Exception #\_\_\_\_\_**

### **STEEL REAR BUMPER WITH CROSSLAYS**

A bolt-on steel bumper shall be installed on the rear of the apparatus to form a full width step area. The top surface of the rear deck shall be constructed of anti-slip bright tread plate. There will be cross lay storage with a cover incorporated into the deck. There shall be a corner step incorporated into each side of the rear bumper. The rear deck shall be installed with sufficient support to form a sturdy, non-deflecting step area for personnel.

### **REAR STEPS**

There shall be eight (8) Cast Products bolt-on steps installed on the rear of the apparatus. Each step shall have large open slots to prevent buildup of ice or mud and to provide a handhold when necessary. Steps shall be provided in the following locations:

- Four (4) bolt-on steps on the left rear of the apparatus.
- Four (4) bolt-on steps on the right rear of the apparatus.

The steps shall be adequately lit with LED lighting. There shall be one (1) light located above each set of steps on the rear face of the body, for a total of two (2) lights. Each light shall be located in a manner that shall light all of the steps on its respective side.

#### **FRONT BODY STEPS AND LIGHTING**

There shall be four (4) Cast Products folding steps located on the front of the left side body compartments. The folding steps shall have two large open slots to prevent the buildup of ice or mud and to provide a handhold when necessary. The steps shall have a surface area of at least 35 square inches and shall be able to withstand a load of 500 pounds.

The steps shall be adequately lit with LED lighting. There shall be one (1) light located above the steps.

#### **FRONT BODY STEPS AND LIGHTING**

There shall be four (4) Cast Products folding steps located on the front of the right side body compartments. The folding steps shall have two large open slots to prevent the buildup of ice or mud and to provide a handhold when necessary. The steps shall have a surface area of at least 35 square inches and shall be able to withstand a load of 500 pounds.

The steps shall be adequately lit with LED lighting. There shall be one (1) light located above the steps.

#### **FRONT VERTICAL AREA TREAD PLATE OVERLAYS**

There shall be a tread plate overlay on the vertical areas of each side of the apparatus body. The overlay will be located in front of the L1 and R1 compartments.

#### **REAR WHEEL WELLS**

The fenders shall be integral with the body sides and compartments with a seamless appearance. The fenders shall be fitted with bolt-in removable full circular inner liners in the wheel well area for ease of cleaning and maintenance. There shall be sufficient clearance provided in the wheel well to allow the use of tire chains when the apparatus fully loaded.

#### **STAINLESS STEEL REAR FENDERETTES**

Two (2) stainless steel fenderettes shall be installed at the outboard edge of the rear wheel well area, one on each side. The fenderettes shall be bolted to the apparatus body using nylon washers to space them slightly away from the body to reduce build-up of road grime. The fenderettes shall be constructed of stainless steel that has been polished to a high quality finish.

#### **STREET SIDE REAR WHEEL WELL BOTTLE COMPARTMENT - WS1**

There shall be a two (2) 8" diameter air bottle compartment installed in the front wheel well area. The compartment shall be a vertical design. The compartment door, hinges and frame shall all be constructed out of stainless steel material. The door shall have a rubber gasket in order to create a 100% seal to protect the interior of the compartment. The storage compartment shall be a rotational, molded component that is assembled to the door and frame. This assembly process shall prevent the air bottle from making contact with the stainless steel frame while loading and unloading the air bottle. The door shall have a brushed stainless steel finish.

**Equipment supplied, stowed or installed in this compartment:**

2-5500 psi / 45 min. carbon fiber cylinder

### **STREET SIDE REAR WHEEL WELL BOTTLE COMPARTMENT – WS2**

There shall be a two (2) 8” diameter air bottle compartment installed in the rear wheel well area. The compartment shall be a vertical design. The compartment door, hinges and frame shall all be constructed out of stainless steel material. The door shall have a rubber gasket in order to create a 100% seal to protect the interior of the compartment. The storage compartment shall be a rotational, molded component that is assembled to the door and frame. This assembly process shall prevent the air bottle from making contact with the stainless steel frame while loading and unloading the air bottle. The door shall have a brushed stainless steel finish.

#### **Equipment supplied, stowed or installed in this compartment:**

2-5500 psi / 45 min. carbon fiber cylinder

### **FUEL FILL**

The fuel fill pocket shall be located in the left rear wheel well area. The fuel fill shall utilize a stainless steel OEM manufactured door with a brushed finish and shall utilize a magnetic latch. The cap of the fuel fill shall be a click-type plastic cap. The hinge and frame shall all be constructed out of stainless steel material. Fuel fill cap shall have a tether.

### **CURB SIDE REAR WHEEL WELL BOTTLE COMPARTMENT - WC1**

There shall be a two (2) 8” diameter air bottle compartment installed in the front wheel well area. The compartment shall be a vertical design. The compartment door, hinges and frame shall all be constructed out of stainless steel material. The door shall have a rubber gasket in order to create a 100% seal to protect the interior of the compartment. The storage compartment shall be a rotational, molded component that is assembled to the door and frame. This assembly process shall prevent the air bottle from making contact with the stainless steel frame while loading and unloading the air bottle. The door shall have a brushed stainless steel finish.

2-5500 psi / 45 min. carbon fiber cylinder

### **CURB SIDE REAR WHEEL WELL BOTTLE COMPARTMENT – WC2**

There shall be a two (2) 8” diameter air bottle compartment installed in the rear wheel well area. The compartment shall be a vertical design. The compartment door, hinges and frame shall all be constructed out of stainless steel material. The door shall have a rubber gasket in order to create a 100% seal to protect the interior of the compartment. The storage compartment shall be a rotational, molded component that is assembled to the door and frame. This assembly process shall prevent the air bottle from making contact with the stainless steel frame while loading and unloading the air bottle. The door shall have a brushed stainless steel finish.

2-5500 psi / 45 min. carbon fiber cylinder

### **BODY RUB RAILS**

Rub rails shall be installed beneath the compartment doors to protect them from damage should the body be brushed or rubbed against another object. The rub rails shall be 3/16” aluminum channel, 2-1/2” x 1”. The rub rails shall be highly polished and then bright dip anodized.

The rub rails shall be installed on the body utilizing non-corrosive nylon spacers and secured with stainless steel bolts. The outside edge of the rub rails shall be even with the fenderettes and bolt-on steps to prevent snagging.

## **REAR TOW HOOK**

One (1) rear tow hook shall be installed directly below the rear of the chassis frame rails. The tow hook shall be capable of a 15,000 lb. straight pull rating.

## **HOSE BED - "ERGONOMIC HOSE LOAD"**

There shall be storage capacity for a minimum of 800 feet of 4" double-jacket or rubber, large diameter fire hose in 100' lengths and 300' of 3" double jacketed hose in 50' sections. For ease of operation, accessibility and safety the hose bed storage area shall be located within the enclosed torque box. Access to the stored hose shall be at the rear center area of the apparatus. Because of safety concerns, designs that require department personnel to climb on the apparatus to reload hose into the hose bed area, or that utilize hose chutes in the design shall not be acceptable.

The hose shall be stored in a storage box specifically designed for ease of operation and maximum safety. The hose box shall be located within the torque box when the apparatus is in the road condition. The storage box shall contain a bottom floor, two sidewalls, and a front-wall. For rapid ease of unloading hose there shall be no rear wall. The hose storage structure shall contain a mechanical means that shall extend and lower the storage box out the rear of the truck for ease of loading the hose. Once reloading operations have been completed the structure shall raise and retract into the bedded condition.

A 12V DC hydraulic pump shall be the power source for the mechanical operational functions of the storage box system. The operational control shall consist of an electric switch that shall be located on the rear of the apparatus for ease of operation. When the box is fully extended and lowered to the reload position the box shall extend out the rear of the apparatus approximately 12' 6". For ease of reloading hose, the top portion of the storage box shall be no higher than 50" from ground level when in the re-load position while on flat terrain. A hydraulic motor pinion gear assembly shall be utilized for the extension/retraction function. One hydraulic cylinder shall be utilized for the lowering/raising function. Provisions shall allow for this system to be manually positioned to the travel position should a mechanical malfunction occur.

The extending substructure shall consist of heavy-duty steel structural members. The storage box shall be fabricated from 3/16" aluminum. The approximate dimensions shall be 144" long x 20-1/2" high x 24" wide. Drain holes shall be located in the bottom of the aluminum storage box. The interior of the hose bed shall be coated with Line-X®, a thermoplastic polyurethane coating. The coating shall be black in color.

Two flashing warning lights shall be installed, one (1) each side on the end of the substructure tubes that alert personnel of the deployed position of the hose box structure. An aluminum side safety shield shall be installed designed to keep items from being caught and damaged when the structure is being lowered and raised. There shall be a 4" white reflective striping affixed to the safety shield to alert motorist during night operation.

Nylon wear pads impregnated with molybdenum disulfide and high in molecular weight shall be used between the telescoping sections for maximum weight distribution, strength, and smoothness of operation. The system shall be designed in such a manner as to only allow activation of the down function after full extension has been reached. The retraction function cannot be activated until the maximum upward travel has been reached.

The torque box enclosure door shall not be connected to the open door warning light system. The EHL system shall include a warning light in the cab specifically to warn the driver that the EHL structure is not in the stored position. The inside, upper portion of the torque box area shall be free of items that may cause interference with the rapid deployment of the hose. The design shall ensure that hose couplers do not bind-up or get caught up during deployment operation.

The floor of the hose bed storage box shall be constructed of Dura-Dek reinforced plastic material. The flooring shall be fabricated of "T" beam pultrusions in parallel connected with cross slats that are first mechanically bonded and then epoxied, forming a large sheet. The top portion of each "T" cross section shall measure 1 1/4" wide and 3/16" thick with beaded ends. The vertical portion shall be 3/8" thick, beading out at the bottom to a thickness of 1/2" and tall enough to result in an overall height of 1". The "T" sections shall be spaced 3/4" apart to allow for drainage and ventilation.

Each "T" beam shall be constructed utilizing a core of 250,000 continuous glass fiber strands that are high in resistance to tension, compression and bending. An outer sheath consisting of a continuous strand mat to prevent lineal splitting shall surround the core. The sheath shall also serve to draw the protective resin to the bar surface. Both reinforcements shall be pulled through an isophthalic polyester resin, treated with antimony trioxide for fire resistance to form a solid length.

The flooring shall then be protected with a polyurethane coating to screen out ultraviolet rays. This bright white coating shall be baked on and provide a pleasing contrast when installed in the apparatus.

**Other ergonomic methods for loading hose from the ground will be reviewed and considered by the St. Louis Fire Department.** List any and all changes to the apparatus and cost associated with this option in the EXCEPTION section of bidder's proposal.

The hose bed shall be contain the following hose load:

100' sections All American Kryptonite 4" supply line-orange storz couplings	8	EHL
50' sections All American Supreme 3" fire line-Tan- NHT thread on 2 1/2" couplings	6	EHL
Akron 4824 w/350 gpm @100 psi baffle and 2390 playpipe.	1	EHL

The interior of the hose bed shall be coated with Line-X®, a thermoplastic polyurethane coating. The coating shall be black in color.

#### HOSE BED DIVIDER

There shall be one (1) hose bed divider installed in the EHL hose bed. The divider shall be fabricated from 3/16" smooth aluminum plate and an aluminum extrusion. The divider shall be coated with black Line-X®. The divider shall be mounted on aluminum "C" channel slide rail at the front, center and rear of the EHL hose bed. The slide rails shall allow full movement of the hose divider along the width of the EHL hose bed. This shall provide the capability for variable hose load configurations and capacities. There be less than a 1/2" gap between the bottom of the hose bed divider and the Dura-Dek flooring to prevent the chance of any hose becoming snagged in the EHL hose bed during deployment.

#### GROUND LADDER STORAGE

The ground ladders shall be stored within the enclosed compartment, located on the curb side of the torque box within the inside wall of the side compartments. The ladders shall be removable from the rear of the apparatus. The ladders shall be enclosed so road dirt and debris cannot foul or damage the ladders. The ladders shall rest in full-length slides and be arranged so they can be removed individually. The slides shall be lined with nylon to aid in moving ladders.

The following ground ladders shall be supplied with the apparatus:

One (1), Duo Safety model 585A-10' folding aluminum ladder shall be provided. The ladder shall be equipped with heavy cast aluminum swivel safety shoes and carrying handles. The closed dimensions of the ladder shall be 11' 5" long x 5.25" wide. The ladder shall include a heat sensor label to warn if the ladder has been exposed to excessive heat. It shall be located in the upper section of the street side ladder compartment.

One (1), Duo Safety model 775-DR-14, 14' aluminum roof ladder shall be provided. The ladder shall be equipped with high strength steel rotating roof hooks with reinforcing brace and steel butt spurs and rounded aluminum top caps for increased durability. The ladder shall include a heat sensor label to warn if the ladder has been exposed to excessive heat. It shall be located in the street side ladder compartment.

One (1), Duo Safety 1200-A, 28' two section aluminum ladder shall be provided. The ladder shall be equipped with steel butt spurs and rounded aluminum top caps for increased durability, and an oversized 2 1/4" pulley for ease of operation. The ladder shall include a heat sensor label to warn if the ladder has been exposed to excessive heat. It shall be located in the street side ladder compartment.

## **PIKE POLE STORAGE**

There shall be six (6) aluminum tubes for the storage of pike poles installed in the ground ladder storage compartment.

The following pike poles shall be supplied with the apparatus:

Akron Brass, Oak Wood Pike Poles item WRO-USA with a standard USA hook shall be provided. The Wood Pike Pole shall be constructed of 1 1/2" red oak handle with the tip sized and tapered and finished with Linseed Oil.

One (1), Akron Brass model, 4' wood pike pike shall be provided. Curb ladder compartment.

One (1), Akron Brass model, 6' wood pike pike shall be provided. Street ladder compartment

Two (2), Akron Brass model, 8' wood pike pike shall be provided. Street ladder compartment

One (1), Akron Brass model, 10' wood pike pike shall be provided. Curb ladder compartment

One (1), Akron Brass model, 12' wood pike pike shall be provided. Curb ladder compartment.

## **HARD SUCTION HOSE STORAGE**

There shall be an enclosed compartment located above the left side of the body, with the capacity to store two (2) sections of 6" hard suction hose, one with a barrel strainer connected. Access to the hard suction hose shall be from the rear of the apparatus through a hinged painted aluminum door.

The suction hose storage shall be enclosed above the left side compartments.

## **HARD SUCTION HOSE, FIREQUIP**

There shall be two (2), Firequip Maxi-Flex PVC 6" x 10' sections of hard suction hose provided, one with a barrel strainer connected.

## **WHEEL CHOCKS**

There shall be one (1) pair of Cast Products model TMC1008-4 wheel chocks provided with the apparatus. The wheel chocks shall be mounted in Cast Products model TMC 1010 mounting brackets.

The wheel chocks shall be stored in locations that are easily accessible under the front of the body on the left side of the apparatus.

## **HANDRAILS**

All handrails, unless otherwise stated, shall be constructed of knurled aluminum of not less than 1-1/4" in diameter. All railing shields and brackets shall be chrome plated, and shall be bolted to the body with stainless steel bolts. The lower bracket on all vertical handrails shall have a drain hole drilled in it at the lowest point.

The following handrails shall be provided on the apparatus:

There shall be a handrail installed on the top street side front of the body.

There shall be a handrail installed on the top curb side front of the body.

There shall be a horizontal handrail installed above the left side of the pump module

There shall be a horizontal handrail installed above the right side of the pump module

There shall be two handrails on the outermost rear body of the apparatus. The handrails shall extend from the uppermost section of the body to just above the bumper. The handrail will be divided in two sections with the upper section serving as a handrail and the lower section as a protective roller for line exiting the hose bed.

### **STOKES BASKET STORAGE**

There shall be an enclosed compartment located above the street side of the body, with the capacity to store one (1) stokes type basket stretcher. Access to the compartment shall be from the rear of the apparatus through a hinged painted aluminum door.

#### **Equipment supplied, stowed or installed in this compartment:**

1-Junkin Stokes Basket – Plastic Model Number: JSA200

1-Flemming 35900PY back board

### **QL-12 ELECTRICAL SYSTEM**

Wiring harnesses shall be the automotive type, engineered specifically for the builder's apparatus, and shall meet the following criteria. Under no circumstances shall diodes, resistors, or fusible links be located within the wiring harness. All such components shall be located in an easy to access wiring junction box or the main circuit breaker area. All wiring shall meet white book, baseline advanced design transit coach specification and Society of Automotive Engineers recommended practices. It shall be stranded copper wire core with cross linked polyethylene insulation complying with SAE specification J1128. Each wire shall be hot stamp function coded every three inches starting one inch from the end and continuing throughout the entire harness. In addition to function coding, each wire shall be number, color, and gauge coded.

Wire harnesses shall be wrapped with a high abrasion and chemical resistant thermoplastic polyester elastomer coated polyester yarn for braiding constructions of electrical wiring systems. The braid yarn shall have a minimum tensile strength of 15 lbs. before breaking and have a maximum of 20% elongation before breaking. Temperature properties for the yarn shall range from a minimum 280°F (138°C) service temperature to a maximum -112°F (-80°C) brittleness temperature with a cold flex tolerance of at least -49°F (-45°C).

Harnesses shall be modular in design; a main harness system subdivided into several smaller sub-harnesses. The harness subsections shall be connected using Deutsch branded, heavy duty, environmentally sealed, connectors with silicone seals and a rear insertion/removal contact system. For isolation of electrical "zones" the harness subsections shall consist of a main harness, a pump harness with a separate pump gauge panel harness, a left body harness with a separate left compartment harness, a right body harness with a separate right compartment harness, and a rear body harness with two separate rear compartment harnesses.

The main harness and three body harnesses shall interconnect at a central, easy to reach location and their connectors shall not be obstructed by other harnesses or fuel/air lines. In addition, the main and body harness connectors shall be color coded for ease of identification with their respective colors noted on the accompanying electrical diagrams.

Where connectors are not provided by the electrical component manufacturer, all 12 volt lights and other electrical components (excluding rocker and toggle switches) shall connect to the harnesses using Deutsch brand connectors; butt connectors are considered unacceptable.

All Deutsch connectors shall meet the following criteria:

- All connectors shall have a minimum IP67 rating.
- Temperature range from -67°F (-55°C) to 257°F (125°C) continuous at rated current.
- Only solid contacts will be used. Stamped and formed contacts are unacceptable.

- All contacts shall be soldered unless a crimping tool or machine is used that gives an even and precise pressure for the terminal being used.
- All contacts shall be pull-tested to insure their integrity.

## **V-MUX ELECTRICAL MANAGEMENT SYSTEM**

The apparatus shall be equipped with a V-MUX Multiplex System. There are several key benefits to multiplexing, one is to reduce the number of connections in a vehicles electrical system, because of this it is important to limit the amount of modules that control certain functions of the vehicle.

### **Outputs:**

The outputs shall perform all the following items without added modules to perform any of the tasks:

1. Load Shedding: The System shall have the capability to Load Shed with 8 levels any output. This means you can specify which outputs (barring NFPA restrictions) you would like Load Shed. Level 1 12.9v, Level 2 12.5V, Level 3 - 12.1V, Level 4 - 11.7V, Level 5 11.3V, Level 6 10.9V, Level 7 10.5, Level 8 10.1. Unlike conventional load shedding devices you can assign a level to any or all outputs. No add-on modules shall be acceptable; the module with the outputs must perform this function.
2. Load Sequencing: The System shall be able to sequence from 0 8 levels any output. With 0 being no delay and 1 being a 1 second delay, 2 being a 2 second delay and so on. Sequencing reduces the amount of voltage spikes and drops on your vehicle, and can help limit damage to your charging system. No add-on modules shall be acceptable; the module with the outputs must perform this function.
3. Output Device: The System shall have solid-state output devices. Each solid-state output shall be a MOS-FET (Metal Oxide Semiconductor - Field Effect Transistors); MOS-FETs are solid-state devices with no moving parts to wear out. A typical relay when loaded to spec has a life of 100,000 cycles. The life of a FET is more than 100 times that of a relay. No add-on modules shall be acceptable; the module with the outputs must perform this function.
4. Flashing Outputs: The System shall be able to flash any output in either A or B phase, and logic is used to shut down needed outputs in park, or any one of several combined interlocks. The flash rate can be selected at either 80, or 160 FPM. This means any light can be specified with a multiplex truck with no need to add flashers. Flashing outputs can also be used to warn of problems. No add-on modules shall be acceptable; the module with the outputs must perform this function.
5. PWM: The modules shall have the ability to PWM at some outputs so that a Headlight PWM module is not needed. No add-on modules shall be acceptable; the module with the outputs must perform this function.
6. Diagnostics: An output shall be able to detect either a short or open circuit.

### **Inputs:**

1. The inputs shall have the ability to switch by a ground or battery signal.
2. The inputs shall be filtered for noise suppression via hardware and software so that RF or dirty power will not trick an input into changing its status.

### **System Network:**

The Multiplex system shall contain a Peer-to-Peer network. A Master Slave Type network is not suitable for the Fire/Rescue industry. A Peer-to-Peer network means that all the modules are equal on the network; a Master is not needed to tell other nodes when to talk.

### **System Reliability:**

The Multiplex system shall be able to perform in extreme temperature conditions, from -40° to +85° C (-40° to +185° F.) The system shall be sealed against the environment, moisture, humidity, salt or fluids such as diesel fuel, motor oil or brake fluid. The enclosures shall be rugged to withstand being mounted in various locations or compartments around the vehicle. The modules shall be protected from over voltage and reverse polarity.

### **WEATHERPROOF DOOR SWITCHES**

Due the harsh environment and susceptibility to moisture on the fire ground, the fire apparatus compartment doors shall utilize weatherproof switches. Two different types of switches shall be used. Weatherproof proximity switches shall be utilized. **No Exceptions.**

The switches shall be used for activation of the compartment lights and to provide a signal to the door open circuit in the cab.

### **TAIL LIGHTS**

There shall be a Whelen M9 series LED tail light assembly installed on each side of the rear of the apparatus. Each tail light assembly shall include one (1) M9BTTX LED red stop/tail light, one (1) Whelen M9TLED amber sequencing arrow turn light and one (1) M9BUW LED clear back up light.

There shall be one (1) additional Whelen M9T LED amber sequencing arrow turn signal located each side at the rear towards the top of the body below the upper C warning lights.

### **MIDSHIP TURN SIGNALS**

There shall be two (2) Truck-Lite model 21 LED midship auxiliary/turn signal lights installed. One (1) light shall be located in the rub rail on each side of the body.

### **BODY GROUND LIGHTING**

There shall be four (4) Grote White 4" round, LED lights model 61E41 installed beneath the apparatus in areas where personnel may be expected to climb on and off of the apparatus. The lights shall illuminate the ground within 30" of the apparatus to provide visibility of any obstructions or hazards. These areas shall include, but shall not be limited to, side running boards and the rear step area.

There shall be four (4) aluminum ground light brackets provided to position each ground light so as to illuminate the ground within 30" of the apparatus.

### **CLEARANCE LIGHTS**

Grote model 65282 red LED clearance lights shall be installed in the rear tailboard as necessary to be in full compliance with applicable ICC and DOT codes and regulations. Clearance reflectors shall be placed on the apparatus to be in full compliance with applicable ICC and DOT codes and regulations.

There shall be two (2), extension marker lights (rubber arm style) installed at the rear portion of the body. The lights shall be attached to the back wall of the rear flex joint area. The purpose of these lights shall be to aid the driver as to the location of the rear of the body during driving operations. The lights shall have bulbs facing both forward and to the rear. The forward facing lights shall be amber in color and the rear facing lights shall be red in color.

### **REAR WORK LIGHT SWITCH**

A switch shall be installed above the tail light bezel on the left side of the rear of the apparatus. The switch shall be wired to the backup lights to provide additional work lighting. The rear work light circuit shall be deactivated when the park brake is disengaged. In addition to the lights being activated by the above switch, the lights shall also come on when the transmission is placed in reverse.

## CAMERA

A Fire Research inView 360 System shall be installed. System shall include 4 cameras, Electronic Control Unit (ECU), and required harnesses and manual camera switch module; shall provide slip video feed with bird's eye view and individual camera views; shall be capable of integrating with vehicle system for automatic camera view switching from front/left/right/rear views based on turn signal and reverse activation; shall feature switch module that allows operator to override default camera view. This system shall be installed utilizing the two Vista displays mounted in cab, Four (4) cameras shall be installed symmetrically around the vehicle perimeter creating a 360 degree field of view or individual side views from the monitor display. Final camera location shall be determined at the preconstruction conference.

The cameras shall be wired to dual Weldon Vista displays located on the driver's and officer's dash. The rear camera shall activate when the transmission is placed in reverse and the right camera shall activate with the right side turn signal and the left camera shall activate with the left side turn signal. All cameras shall also be activated by a button on the Vista display.

A Fire Research inView Guardian System shall be installed. System shall include DVR which shall record up to 4 video channels plus 1 high-definition channel at 30 FPD on all channels simultaneously; video resolution shall be 720x480 D1 on four channels and 1280x720 HD progressive scan on the high definition channel; shall feature dual streaming technology that records two information streams, one for hi-res payback and one low resolution, low frame rate stream for real-time viewing over cellular networks if equipped with optional hardware and cellular system vMax Stream software service support; shall feature 500 GB main storage (HDD) and 32 GB of back up storage on SD card; Shall support geofencing capability which delivers alerts when a vehicle deviates from geographic boundary; shall support frame advance, FFD and RWD playback up to 32X; shall offer 30 port 3 Ethernet switch ports (TCP/IP); shall have Smart-Temp technology to ensure providing automatic monitoring of DVR operational remains at optimal operating temperature and DVR control; shall have Smart-Start technology to ensure DVR is safeguarded against electrical spikes with vehicle startup voltage protection; shall include built-in 3 axis G-sensor; shall operate from 8 to 32VDC; shall have transient protection for 600 W for power input, 400 W per signal input; shall be 2.5"H x 7"W x 9.5"D; shall weigh 5.3 lbs; shall operate from -22 degrees F to 122 degrees F; shall meet FCC emissions requirements; shall be meet tested in accordance with SAE-1455 and MIL-STD 810 Vibration requirements; shall include GPS receiver for recording of vehicle speed and location.

Shall include :

- Four (4) CHWA – High Definition Cameras (Guardian system)
- Four (4) CA 650TVL – Standard Definition Cameras (360 system)
- 

**Will furnish section as written: Yes \_\_\_ NO \_\_\_ Exception # \_\_\_\_\_**

## APU- AUXILIARY POWER UNIT

The apparatus shall be equipped with an auxiliary power unit (APU) specifically designed to reduce idle time of the main chassis engine. Benefits of the auxiliary power system shall reduce the amount of emissions otherwise released from the main chassis engine as well as greatly reduce the amount of fuel used during the in-service life of the apparatus.

The APU shall provide 12v DC power, 120/240v A/C power and HVAC for the apparatus. Idle times of the main chassis engine are reduced utilizing automatic start / stop control of the main chassis engine and the APU. In addition to automatic control, manual control of the APU shall be provided. The APU shall be adequately enclosed and protected from the elements. Systems that require the APU to run continuously in conjunction with the main chassis engine are not desired and shall be immediately rejected.

## SYSTEM COMPONENTS

- **Diesel Engine** – Caterpillar C1.5 Tier 4 Emissions diesel engine. Fuel for the operation of the APU shall be provided from the chassis fuel tank. A separate fuel pick up shall be provided to the APU engine
- **Alternator** – 12v power for the apparatus shall be provided by a 300 amp Niehoff alternator. The alternator shall be synchronized in conjunction with the chassis alternator to share the total 12v load when both engines are running, reducing wear and increasing service life.

- **Generator** – 9.5 kw Continuous 12 kw Peak (Maximum Rating) Marathon generator
- **HVAC** – The HVAC system shall utilize a TM 16 HS 162.9 cm<sup>3</sup> integrated with the chassis supplied condenser and evaporator with a cooling capacity of 32,000 BTU/hr. The heating system shall be chassis supplied. Heat output shall be 60,000 BTU/hr. and a defrost capacity of 45,000 BTU/hr. In addition, there will be a 40,000 BTU/hr. rated auxiliary heater installed in the cab area to provide cabin heat when the chassis engine is shut off. Coolant for the heater shall be supplied from the APU engine. The heater lines shall be insulated and equipped with a coolant booster pump providing more efficient coolant flow due to the long distance between the heater and APU engine.

## CONTROLS

There shall be two integrated display control panels located in the cab and on the pump panel. The displays shall provide the user with the following information:

- Mode selector for manual or automatic operation
- Start/stop switch for manual operation
- Run indicator
- 120/240 VAC generator information: volts, frequency, and amps (each leg)
- Low voltage warning at 11.9 VDC
- Engine hours (with maintenance required indicator)
- Engine overheat warning indicator
- Engine low oil pressure warning indicator
- Glow plug preheat indication
- Shutdown status (low oil pressure or high water temperature)
- Time remaining on auto start timer
- Automatic day/night mode (user enabled)

## SYSTEM OPERATION

The APU automatically engages once the factory pre-determined conditions have been met. When the chassis engine remains at an idle condition for a predetermined period of time, and only after the park-brake has been engaged, the APU system shall automatically engage and provide power to the apparatus. Once all conditions are met the APU system shall automatically begin chassis engine shut-down.

The APU, when activated, shall supply power for the following features/components of the apparatus:

- 12-volt scene lights
- 12-volt chassis interior lights
- 12-volt compartment lights
- DOT running lights
- Head and tail lights
- Warning lights

- Cab heater and air-conditioning
- Engine block heater (optional)
- Heated mirrors (optional)
- AC generator features (lights, cord-reel, etc....)

The doors that enclose the APU shall be equipped with an interlock that shall prevent the unit from starting during service procedures when the doors are open.

#### AUTO MODE (PUMP/PTO NOT REQUIRED)

When the mode selector switch is set to "Auto" and the chassis master power disconnect and ignition switches are turned on, the APU controller shall power up and display any available data on the screen.

If the chassis engine is not started the system will "reset" and enter into a "standby" mode.

After the chassis engine is started and the park brake is not released within a factory set time frame, the system shall issue a message on the display, illuminate the preheat indicator light on both displays, power up the glow plug preheat circuit, and trigger an audible alarm. When the glow plugs are sufficiently warmed, the APU engine will start.

The factory set time frame shall be adjustable with factory assistance.

Once started, the system shall shut down the chassis engine.

Should the park brake be released within the factory set time frame, the timer shall restart and the APU shall remain on standby.

Whenever the ignition switch is turned off then back on, the system will power up in AUTO MODE, regardless of the previous mode. If the unit was in MANUAL MODE, and the ignition switch is turned off then back on, the system will power up in AUTO MODE.

#### AUTO MODE (PUMP/PTO REQUIRED)

When the apparatus arrives at the scene and use of the fire pump or PTO (If equipped) is required, the system shall "not" activate the APU if the following conditions are met:

- Pump engaged signal and/or
- Aerial master signal (or PTO) and/or
- Loss of neutral signal and/or
- Loss of park brake signal

When operation of the pump and/or PTO is no longer required, the system shall activate the APU if the following conditions are met:

- Pump is disengaged and/or
- Aerial master (or PTO) is shut off and/or
- Transmission is shifted to neutral and/or
- Park brake is applied

Should the operator determine the chassis engine is to be started, the operator shall utilize normal procedures for engine start as per departmental procedures. When the chassis engine has been started, both the chassis engine and the APU shall both continue to run. Once the park brake is released, the APU shall shut down and “reset” to standby mode within 5-7 seconds. Turning the master power disconnect switch to the off position shall automatically shut down the APU system.

#### MANUAL MODE

Should manual operation of the system be desired the mode selector switch shall be set to “Manual” and the chassis master power disconnect switch is turned on, the APU controller shall power up and display any available data.

The APU shall not operate until the start button is pressed. When the button is pressed, the system shall issue a message on the display, illuminate the preheat indicator light on both displays, power up the glow plug preheat circuit, and trigger an audible alarm. When the glow plugs are sufficiently warmed, the APU engine will start.

The APU shall continue to run until the operator hits the start (stop) button or turns off the master power disconnect switch.

#### DISABLE MODE

When the mode selector switch is set to “Disable” and the chassis master power disconnect switch is turned on, the APU system shall be entirely shut-down and inoperable.

#### AC OVERRIDE INPUT

There shall be an input programmed to the APU controller. This input will be on (+12 VDC) whenever the chassis supplied HVAC controller is on (AC, defrost, defog, etc.). When this input is active, the APU controller will immediately initiate the startup sequence.

This input is very similar to Auto Mode in that it will shut down the chassis engine if the appropriate conditions are met. The primary difference between the AC override input and Auto Mode is that the standby condition and the timer interlocks (park, neutral, pump/PTO) will be overridden/ignored by the APU controller when HVAC input is active.

The generator shall be operational through a manual start while the chassis transmission is in 'DRIVE'.

The APU System shall be located inside the top of the pump module.

**Will furnish section as written: Yes \_\_\_NO\_\_\_Exception # \_\_\_\_\_**

#### **20 CIRCUIT NON-GFI LOAD CENTER**

There shall be a 120/240 volt load center incorporated into the 120/240 volt wiring system. The load center shall include adequate circuit breakers to protect the loads specified on the apparatus. The entire 120/240 volt electrical system shall be installed in strict compliance with NFPA 1901. This shall include all testing, labeling, wiring methodology, and dimensional requirements. Certification of compliance shall accompany the apparatus at the time of delivery. All 120/240 volt A.C. Wiring shall be done in accordance with NFPA 1901 as well as nationally accepted electrical codes.

#### BRANCH CIRCUIT OVERCURRENT PROTECTION

Over current protection devices shall be provided for circuits in accordance with NFPA 1901. The load center shall be equipped with a non-GFI two pole main breaker when the six or more individual branch circuits are present. Over current protection devices shall be marked with labels to identify the function of the circuit they protect.

The load center shall be located on the back wall of the S1 compartment.

#### **RECIRCULATION SYSTEM**

There shall be a 120V re-circulation system installed for use with the APU system. The re-circulation system shall be used to prevent the pump from freezing in sub-freezing temperatures. The system shall use water from the water tank, circulate it through the fire pump and transfer it back to into the water tank through the booster line after it is inserted into the water tank dome. The system shall be powered by a 1/3 hp 120V pump, controlled by a switch on the pump panel. There shall also be two (2) quarter-turn valves located on the pump panel to control the water flow and two (2) 1/4" drains with petcock control to drain the water from the system. The re-circulation system shall be controlled by a circuit breaker in the load center.

### **APU HEAT DEFLECTION SYSTEM**

There shall be a thermostatically controlled heat deflector shield installed for use with the APU system. When closed the deflector shield allows the heat generated from the APU system to exit away from the apparatus. When the ambient air temperature lowers the thermostat opens the deflector shield to force the heated air from the APU system into the pump compartment to help prevent freezing inside the pump compartment.

**Will furnish section as written: Yes \_\_\_ NO \_\_\_ Exception # \_\_\_\_\_**

### **UPPER ZONE A**

A Whelen Edge® Ultra Freedom IV™ Linear Super-LED® WC Series 72" lightbar model # F4W7RRBB shall be provided. The end modules shall be blue LED on the officer's side and red LED on the driver's side.

There shall be a fully populated front with 12 light modules. From driver's side to officer's side the modules shall be blue, red, blue, red, blue, red over blue, red over blue, red, blue, red, blue, red. All lenses shall be clear.

There shall be two (2) Whelen PT360W Pan & Tilt Super LED Spotlights mounted, one each side on cab roof.

### **UPPER ZONE C**

There shall be two (2) Whelen warning lights installed. The driver's side lights shall be a Whelen L31HRF (Red) and the passenger's side light shall be a Whelen L31HBF (Blue). The lens shall be clear.

There shall be two (2) stanchion brackets provided.

### **LOWER ZONE A**

The warning lights shall be supplied and installed by the chassis manufacturer.

### **LOWER ZONE B**

There shall be one (1) Whelen 60BR6FCR ½ Red, ½ Blue, Side-by-side with Clear Outer Lens LED warning light with 20 Scan-Lock flash patterns and independent on/off control installed.

### **LOWER ZONE C**

There shall be two (2) Whelen 60BR6FCR ½ Red, ½ Blue, Side-by-side with Clear Outer Lens LED warning lights with 20 Scan-Lock flash patterns and independent on/off control installed.

### **LOWER ZONE D**

There shall be one (1) Whelen 60BR6FCR ½ Red, ½ Blue, Side-by-side with Clear Outer Lens LED front warning light with 20 Scan-Lock flash patterns and independent on/off control installed.

### **LIGHT TOWER**

A Command Light, manufactured by Command Light, part number CL602A-FM, light tower shall be provided for installation on the apparatus. The location of the light tower and its controls shall be installed according to instructions given by the customer and the requirements of the light tower manufacturer.

The light tower shall extend 131" above the mounting surface and shall extend to full upright position in less than 15 seconds. The overall size of nested light tower shall be approximately 41" wide x 74" long x 12" high and weigh approximately 300 pounds.

### **Light Tower Construction and Design**

The light tower assembly shall be of aluminum construction, with stainless steel shafts and bronze bushings for long life and low maintenance.

The electrically controlled unit shall not require usage of the vehicle's air supply for operation, thereby eliminating the chance for air leaks in the vehicle braking system. Hydraulic or pneumatic type floodlights are not acceptable alternatives to the specified all electric light tower.

The light tower shall be tested to in wind conditions of 90 mph (150 kph) minimum. Other type floodlights that have not been tested to these conditions are not acceptable.

The light tower shall be capable of overhanging the side or back of the vehicle to provide maximum illumination to the vicinity adjacent to the vehicle for the safety of emergency personnel in high traffic conditions. Any tower that is only capable of rotations at the top of a pole is not an acceptable alternative to the specified tower.

### **Light Tower Electrical System**

The light tower shall be a two-stage articulating device with a lighting bank on top of the second stage capable of continuous 360 degree rotation. The light shall be elevated by electric linear actuators, one (1) actuator shall elevate the light bank and one (1) actuator shall adjust the light bank angle from 0 to 110 degrees. Power for the light bank shall be supplied through power collecting rings thus allowing continuous 360 degree rotation in either direction.

The tower base shall have a light that illuminates the envelope of motion during any movement of the light tower mast as required by NFPA1901.

### **Light Tower Controls**

The light tower shall be controlled with a hand-held 15 foot umbilical line remote control. The storage station for the remote control unit shall be equipped with a button to activate the "Auto-Park" automatic nesting feature.

The controls on the remote box shall be:

Three (3) switches, one (1) for each light bank.

One (1) switch for optional light bank rotation.

One (1) switch for the optional strobe.

One (1) switch for lamp tree rotation.

One (1) switch for elevating lower stage.

One (1) switch for elevating upper stage.

One (1) indicator light to indicate when light bank is out of roof nest position.

One (1) indicator light to indicate when light bank is rotated to proper nest position.

### **Light Tower Floodlights**

The Command Light shall be equipped with the following bank of floodlights:

Floodlight manufacturer:	Fire Research Corporation
Number of lamp heads:	Six (6) Spectra SPA851-B28
Voltage:	120 VAC
Watts of each lamp head:	335 watts
Total watts of light tower:	2300 watts
Total Lumens of light tower:	168,000 lumens

Configuration: The light heads shall be mounted in three (3) on each side of the light tower, giving two (2) vertical lines of three (3) when the lights are in the upright position.

### **Options**

The Command Light shall be equipped with the following options:

#### *Backlight:*

-Bottom light bank able to rotate up to 180 degrees opposite of the top 2 banks of lights. This keeps 4 lights fixed on the main scene while allowing illumination or heating in other areas.

#### *Top Mounted Mini Light Bar*

-A Whelen Mini Legacy lightbar model GT9RRBBP shall be factory mounted by Command Light on the top of the tower.

The hand-held remote control shall have an additional switch supplied for the backlight rotation option.

#### Light Tower Paint

The light tower shall be electrostatically powder coated with a hammer tone gray color.

#### Light Tower Mounting

The specified light tower(s) shall be recessed into the roof of body to allow light tower(s) to be stowed below roof level. The floor and side walls of recessed area shall be fabricated as a separate module from 3/16" aluminum treadplate with an overlapping 3" flange around perimeter roof line. The recessed area shall be completely water tight. All electrical connections made to light tower shall be located on sidewalls for a water tight connection.

The recessed area shall have two (2) water drain holes (in opposite corners) with flexible 1" diameter hose routed to the area below the body.  
for lightbar.

The light tower shall be recessed above the body of the apparatus. The controls for the light tower shall be located inside compartment L1.

### **REAR 12 VOLT SCENE LIGHTS**

There shall be TWO (2) Whelen, model M9LZC, Super-LED® Gradient Scene light installed on the apparatus. The light shall be complete with chrome flange.

The 12 volt rear scene light shall be controlled by one (1) switch located in the chassis cab and one (1) switch located at the pump panel. Each switch shall have an indicator that shall illuminate when the switch is in the "ON" position. The lights shall be controlled by one (1) switch at each location. The switch shall be labeled "REAR SCENE."

In addition to each switch located in the cab and at the pump panel, the 12 volt rear scene light shall be activated by the rear work light switch and when the apparatus is placed in reverse.

The 12 volt scene lights shall be located on the rear of the apparatus body.

### **ELECTRIC CORD REEL**

There shall be Akron Brass, model ERWC-15-10, electric rewind cord reel installed on the apparatus. The cord reel shall be equipped with a universal frame that will allow the 12 volt motor to be mounted in four (4) different positions. All metal parts, except for the electric motor and sprocket teeth, shall be powder painted red. All hardware shall be stainless steel. The cord reel disks shall have rolled edges to prevent sharp edges. The cord reel shall include the solenoid, switch and circuit breaker. The reel shall be covered by an Akron Brass five (5) year warranty. Rollers be supplied to prevent damage to the electrical cable if pulled in any direction.

The cord reel shall be equipped with 200' of yellow STW Seoprene 10/3 wire installed with a cable stop to prevent damage to cable fittings. The cord should be supplied with a female L5-20 twist lock plug.

## JUNCTION BOX

There shall be an Akron Brass Extenda-Lite, model EJBX, back lighted electrical junction box equipped with four (4) electrical receptacles, two (2) per side. Each receptacle shall be equipped with a spring loaded snap cover. The cord reel shall be connect to the cast aluminum junction box through a 12" pigtail with heavy duty water resistant strain relief and flexible extender. The pigtail shall utilize a L5-20 twist lock plug and connector to supply power to the four (4) receptacles. Each side of the junction box shall be fitted with polypropylene faceplates, which are back lighted, so that plug orientation to the receptacles is quick and easy to align.

The junction box shall be equipped with an Akron Brass model CS cord stop.

A tread plate mounting bracket shall be included.

There shall be four (4) NEMA L5-20R, 120 volt, single, 3-wire, twistlock receptacles installed in the junction box. Each receptacle shall have a 20 ampere rating.

The reel shall be located in the dunnage compartment.

## **REAR WORK LIGHT WIRING**

The backup lights shall be wired to the rear work light switch. This switching circuit shall be deactivated when the parking brake is released. **The lights shall also be activated when the transmission is placed in reverse.**

## CAB SWITCH

There shall also be a switch provided in the cab to activate the backup lights. This switching circuit shall be deactivated when the parking brake is released. **The lights shall also be activated when the transmission is placed in reverse.**

## **STREAMLIGHT™ RECHARGEABLE HANDLAMPS**

There shall be four (4) Streamlight, Survivor model 90519, high intensity rechargeable hand lamps supplied and installed on the apparatus. Each hand lamp shall be yellow in color and include one (1) model 3760F charger and be wired direct to the chassis batteries.

These lights shall be installed in the chassis cab on the engine tunnel console. Exact location to be determined at pre-construction.

## **LITEBOX**

There shall be one (1) Streamlight, Vulcan model 44451 high intensity LED hand lantern supplied and installed on the apparatus. The lights shall be orange in color. There shall be Streamlight Products Direct Wiring 12volt charger assembly provided with the light.

**Will furnish section as written: Yes \_\_\_ NO \_\_\_ Exception # \_\_\_\_\_**

## **BODY PAINT PREPARATION**

After the body and components have been fabricated and assembled they then shall be disassembled prior to painting so when the apparatus is completed there shall be finish paint beneath the removable components. The apparatus body and components shall be metal finished as follows to provide a superior substrate for painting.

All aluminum sections of the body shall undergo a thorough cleaning process starting with a phosphoric acid solution to begin the etching process followed by a complete rinse. The next step shall consist of a chemical conversion coating applied to seal the metal substrate and become part of the aluminum surface for greater film adhesion.

After the cleaning process, the body and its components shall be primed with a High Solids primer and the seams be caulked.

All bright metal fittings, if unavailable in stainless steel or polished aluminum, shall be heavily chrome plated. Iron fittings shall be copper under plated prior to chrome plating.

### **PAINT PROCESS**

The paint process shall follow the strict standards as set forth by PPG Fleet Finish Guidelines.

The body shall go through a three-stage paint process: primer coat, base coat (color), and clear coat. In the first stage of the paint process the body shall be coated with PPG F3980 Low VOC / High Solids primer to achieve a total thickness of 2-4 mills. In the second stage of the paint process the body shall be painted with PPG FBCH Delfleet™ High Solids Polyurethane Base Coat. A minimum of two to three coats of paint shall be applied to achieve hiding. In the final stage of the paint process the body shall be painted with PPG DCU-2002 Clear Coat. A minimum of two to three coats shall be applied to achieve a total dry film thickness of 2-3 mills.

As part of the curing process the painted body shall go through a Force Dry / Bake Cycle process. The painted components shall be baked at 185 degrees for 3 hours to achieve a complete coating cure on the finished product.

### **HAND POLISHED**

After the Force Dry / Bake Cycle and ample cool down time, the coated surface shall be sanded using 3M 1000, 1200, and or 1500 grit sandpaper to remove surface defects. In the final step, the surface shall be buffed with 3M super-duty compound to add extra shine to coated surface. No more than .5 mil of clear shall be removed in this process.

### **BODY COLOR**

The body shall be painted with PPG High Solids Polyurethane Base Coat.

The upper portion of the two-tone body shall be painted (BLACK) PPG# FBCH-9000.

The lower portion of the two-tone body shall be painted (RED) PPG# FBCH-71096-ALT.

### **UNDERCOATING**

The apparatus shall undergo a two (2) step undercoating process. The first step shall be a rubberized polyurethane base compound that is applied after the body has been primed. The materials used incorporate unused paint products to reduce the amount of waste released into the environment. This coat shall be applied to all hidden pockets and surfaces that shall not be visible after completion.

As a final step, the entire underside of the body shall be coated with a bituminous based automotive type undercoating when the apparatus is completed. During this application, special care shall be taken to avoid spraying the product on air lines, cables, or other items that would cause normal maintenance to be hindered.

### **COMPARTMENT COATING**

The interior of the body compartment shall be coated with gray Line-X® thermoplastic polyurethane coating. The coating shall be durable enough to withstand every day abuse of equipment removal and shifting.

### **LINE-X® THERMOPLASTIC COATING**

In designated areas, Line-X® XS-350, a two component spray-in-place thermoplastic polyurethane system shall be used for maximum protection of the body and equipment. Line-X® XS-350 is a 100% high performance aromatic solids pure Polyurea elastomeric membrane. The coating shall be a fast cure, textured surface, multi-purpose material designed for commercial and industrial applications. It shall exhibit excellent adhesion to the body and serve as a protective, abrasion resistant liner where applied.

The coating shall exhibit the following minimum typical physical properties:

- Tensile strength - 3,432 PSI (ASTM D-412)
- Elongation - 162% (ASTM D-412)
- Tear Strength - 783 PLI (ASTM D-624)
- Shore D Hardness - 60 +/-1 (ASTM D-2240)

### **TOUCH UP PAINT**

One (1) two ounce bottle of acrylic enamel touch-up paint or two (2) touch up paint pens, if color is available, shall be supplied.

### **CORROSION PREVENTION**

One (1) 3.75 ounce tube of Electrolysis Corrosion Kontrol (ECK) shall be provided to use whenever additional items are mounted to the apparatus.

ECK protects aluminum and stainless steel against electrolytic reaction, isolates dissimilar metals and gives bedding protection for hardware and fasteners. ECK contains anti-seizing lubricant for threads. ECK is dielectric and perfect for use with electrical connectors.

### **NFPA COMPLIANT REFLECTIVE STRIPING**

Reflective striping shall be applied to the exterior of the apparatus in a manner consistent with NFPA 1901. It shall consist of a 1", 4", and a 1" wide stripe low across the front of the chassis and along the sides up to the first compartment on each side where it shall transition to a point in the upper compartments where it then shall run level to the back edge of the body. There shall be a 1" gap provided between each of the stripes.

### **REFLECTIVE STRIPE TERMINATION**

The NFPA reflective stripe located on the side of the apparatus shall terminate at the side of the front bumper.

There shall also be reflective striping provided on the front face of the bumper.

The color of the upper reflective striping on the apparatus shall be black.

The color of the main reflective striping on the apparatus shall be black.

The color of the lower reflective striping on the apparatus shall be black.

### **RUB RAIL REFLECTIVE STRIPING**

There shall be 2" reflective striping installed in the rub rail channel. The reflective striping shall be diamond grade quality material for increased visibility. The reflective shall be silver in color.

### **CHASSIS CAB PAINT BREAK**

There shall be 23.5kt engine turned gold leaf striping installed at the two tone paint break on the chassis cab and body.

### **CAB DOOR REFLECTIVE STRIPING**

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 black stripes. The chevron tape shall measure 6.00 inches in height.

### **CHEVRON REFLECTIVE STRIPING ON REAR**

In addition to the custom striping pattern supplied on the apparatus, there shall be additional reflective striping applied to the entire rear of the unit. The reflective striping shall cover at least 50% of the rear facing vertical surface per NFPA 1901. The striping shall consist of alternating reflective stripes. Each stripe shall be a minimum of 6" in width and shall be applied to the apparatus at 45° angle.

The chevron striping shall consist of 3M red and black reflective striping.

Only 3M Diamond Grade™ VIP Reflective Striping shall be used.

### **GRAPHICS PROOF**

A color graphics proof of the lettering layout shall be provided for approval by ST. LOUIS FIRE DEPARTMENT prior to installation. The graphics proof shall be submitted to ST. LOUIS FIRE DEPARTMENT on 8.5" x 11" sheets with front, sides, rear and plan views, each on one (1) sheet. In addition if there is any special art work an additional sheet shall be provided showing all details.

### **GOLD LEAF LETTERING**

There shall be twenty two (22) 23.5KT gold leaf letters provided and installed on the apparatus. The letters shall be approximately 4" tall with black outline and shadow. The letters shall read "ENGINE CO. ##". They shall be placed on the rear cab door. Final placement at pre-paint.

### **REFLECTIVE LETTERING LETTERING, 20"**

There shall be four (4) black reflective letters provided and installed on the apparatus. The letters shall be approximately 20" tall. Characters shall indicate the assigned company number and shall be placed on the rear side compartment doors (S3 and C3).

### **REFLECTIVE LETTERING, 8"**

There shall be four (4) black reflective letters provided and installed on the apparatus. The letters shall be approximately 8" tall. Characters shall indicate the assigned company number preceded by an "E-" (E-XX) and shall be placed on the front bumper

### **GOLD LEAF LETTERING, 12"**

There shall be forty four (44) 23.5KT gold leaf letters provided and installed on the apparatus. The letters shall be approximately 12" tall with black outline and shadow. They shall read "ST. LOUIS FIRE DEPARTMENT" and will be placed on the upper body section above the compartments

### **REFLECTIVE LETTERING, 48"**

There shall be three (3) reflective characters provided and installed on the apparatus. The characters shall be approximately 48" tall. Characters shall indicate the company assigned number and will be placed on the roof of the cab. Characters shall indicated the assigned company number preceded by an "E-" (E-XX) and shall be placed on the cab roof.

### **REFLECTIVE LETTERING, 24"**

There shall be four (4) black reflective letters installed on the apparatus. The letters shall be approximately 24" tall. Characters shall indicate the assigned company number preceded by an "E-" (E-XX) and shall be placed on the rear of the apparatus.

**CUSTOM DOOR DECALS**

There shall be one (1) pair of St. Louis door decals provided. The decals shall be installed as per the customer specifications at pre-paint inspection.

**Addendum equipment and mounting Instructions:**

Equipment List by location

ITEM	Qty	Description	Mounting Instruction	
<b>CAB</b>				
<b>Front bumper:</b>				
1	1	Akron 4836 2 1/2" High Range Assault Break apart nozzle with pistol grip.	Stowed in front bumper tray	
2	4	All American Supreme – 50' x 2 1/2" Tan Hose. Thread shall be NH on 2 1/2" Couplings. On the female couplings shall be stamped "STLFD"	Stowed in bumper tray	
<b>Captains seat area:</b>				
3	1	Fire Hooks Maximus Halligan Tool-step insert	Tool to be mounted in a fabricated tray in the step area inside the captain's door	
4	1	Bad Ax forcible entry tool	Install the Bad ax forcible entry tool in fabricated brackets on the inside of the officer's cab door. The axe head should be captured in a box type bracket	

			and the handle captured in a PAC Handle Loc bracket.	
5	1	Panasonic Toughpad FZ-G1 Win8 (Win8.1 Pro COA), vPro Intel Core i5-4310U 2.00GHz, 10.1" WUXGA 10-pt Gloved Multi Touch+Digitizer, 128GB SSD, 8GB, intel WiFi a/b/g/nac, TPM, Bluetooth, Dual Pass (Upper:WWAN/Lower:GPS), Insertable Smartcard, 4G LTE Multi Carrier (EM7355), Webcam 8MP Cam, 2D Bar LED (EA11), Rotating Hand Strap, Tall Corner Guards, No Drive, Toughbook Preferred. Docking Station with Keyboard	Laptop computer to be mounted on dash forward of the captains position in a dedicated docking station.	
6	1	Scott Air-Pak X3 w/snap change , standard harness, 5.5 system, EZ-Scape Pro fixed belt, EZ Scape System, 50' t-Safe rope, Crosby hook, F4 descender, standard regulator, Dual EBSS, SEMSII with Bluetooth, 5500 psi / 45 min. carbon fiber cylinder, AV300-HT face piece with Kevlar Head net and right Side Communications bracket.	Seats will be provided with appropriate system to accept this SCBA design.	
7	1	St. Louis Fire Department compatible Knox Box Model 2651	Box will be mounted on dog house assembly left of the captain's seat. Circuit shall be 12v power and shown on the electrical blueprint.	
8	1	2.50 pound D.O.T approved fire extinguisher with BC rating.	Shall be shipped loose with the cab.	
9	1	Emergency road safety triangle kit.	Shall be shipped loose with the cab.	
10	4	Streamlight model 90519 high intensity rechargeable hand lamps supplied and installed on the apparatus. Each hand lamp shall be yellow in color and	Chargers to be wired direct and mounted two front two rear on dog house.	

		include one (1) model 3760F charger.		
11	1	Thermal Imaging Camera MSA 6000 with following: 2 – 3 Hour Batteries, Battery for Life, Truck Mount Charger, and Retractable Lanyard	Charger to be wired direct and mounted on dog house-final location to be determined at pre-paint.	
<b>Cab Rear, medical compartment:</b>				
12	1	Meret PRB3+PRO Personal Response Bag (TS2 Ready)	<b>Stowed in this compartment:</b>	
13	1	Meret recover pro O2 5008	<b>Stowed in this compartment:</b>	
14	1	R & B Cervical collar bag Model 6850R	<b>Stowed in this compartment:</b>	
<b>Cab Rear, Foot Locker:</b>				
15	1	200' CMC Orange ½" kernmantle rope #273210	<b>Stowed in this compartment:</b>	
16	1	CMC Stuff bag for above #430201 orange	<b>Stowed in this compartment:</b>	
17	2	CMC #300253 carabiners	<b>Stowed in this compartment:</b>	
18	2	CMC #370073 carabiners	<b>Stowed in this compartment:</b>	
19	1	CMC Water throw bag w/50' rope #291550	<b>Stowed in this compartment:</b>	
20	1 Kit	Rigid 18 volt impact driver R86035SB	<b>Stowed in this compartment:</b>	
21	1	Dewalt DW2521 driver bit set	<b>Stowed in this compartment:</b>	
22	1	<b>Department supplied AED</b>	Supplied by the purchaser	
23	1	MSA Altair 5x, 5 gas monitor		
<b>Cab rear, over seat compartment</b>				

24	1	Ansul 430847 2.5 gallon water extinguisher	Extinguishers will be mounted and strapped to comply with current NFPA standard	
25	1	Ansul 431554 20# CO2 extinguisher	Extinguishers will be mounted and strapped to comply with current NFPA standard	
26	1	Ansul 429011 20# purple K ABC extinguisher	Extinguishers will be mounted and strapped to comply with current NFPA standard	
<b>Cab rear, over seat compartment</b>  <b>Cont'd</b>	2	Akron Brass 6' Oak Wood Pike Pole item WRO-USA with a standard USA hook shall be provided. The Wood Pike Pole shall be constructed of 1 1/2" red oak handle with the tip sized and tapered and finished with Linseed Oil.	There shall be two sets of pike pole brackets, Zico Quic-Mount VM-5 located in the chassis cab. Location to be determined at pre-construction.	
<b>Cab Rear</b>				
27	1	TNT No. TN-635 Fire Tool	Install a TNT tool on the left side of the equipment compt. in crew cab with a fab. bracket for the sledge head at floor, and a PAC Handle Lock bracket for the handle.	
28	1	Akron WP-6 Pick head axe	Install a pick head axe on the right side of the equipment compt. in crew cab with a fab. bracket for the axe head at floor, and a PAC Handle Loc bracket for the handle.	
29	3	Scott Air-Pak X3 w/snap change , standard harness, 5.5 system, EZ-Scape Pro fixed belt, EZ Scape System, 50' t-Safe rope, Crosby hook, F4 descender, standard regulator, Dual EBSS, SEMSII with Bluetooth, 5500 psi / 45 min. carbon fiber cylinder, AV300-HT face piece with Kevlar Head net and right Side Communications bracket.	SCBA's will be mounted in Secure-all bracket in each forward facing seat and the one rear facing seat.	
<b>Pump Dunnage area:</b>				

31	1	New PIGG PAK928 Chemical containment pool	Stow in fabricated compartment in dunnage area	
32	1	Akron Brass, model ERWC-15-10, electric rewind cord reel	Install the Akron cord reel in dunnage area above curb side pump panel	
<b>Appliance Storage Locker:</b>				
33	1	Akron 535 2.5" Cellar Nozzle	Install 2.5" male screw plate for the cellar nozzle on tool board	
34		Akron 2581 2.5" x (2) 1.5" Gated WYE	Install 2.5" male screw plate for the 2.5" x (2) 1.5" gated wye on tool board	
35	1	Red Head 36 2.5" Double Male	Install 2.5" female screw plate for the double male adapter on tool board.	
36	1	Red Head 35 2.5" Double Female	Install 2.5" male screw plate for the double female adapter on tool board	
37	2	Red Head 37 2.5" to 1.5" Reducer	Install two (2) 2.5" male screw plates for the 2.5" to 1.5" reducers on tool board	
38	1	Red Head 37R115 1.5" MNST x 1" female (CHT)	Install one (1) 1.5" female screw plate for the 1.5" MNST x 1" Female Booster Thread reducer on tool board	
39	1	Red Head S54R425 4" Storz to 2.5" rocker lug female	Install 4" Storz screw plate for the 4" Storz to 2.5" female NST adapter on tool board	
40	1	Red Head S60S54 5" Storz to 4" Stortz Adapter	Install 4" Storz screw plate for the 4" Storz to 5" Storz adapter on tool board	
41	1	Set Head KS34 Combo w/ four 4"-2.5" spanners	Install 4" Storz spanner wrench set on the door of the hose fitting compartment	
42	1	set-Akron No. 448 Bracket w/two Style 10 Spanner Wrenches	Install Akron 448 bracket for two (2) Style 10 spanner wrenches on the door of the hose fitting compartment	

43	1	set-Akron Style 25 Booster spanner wrenches	Install two (2) Style 25 booster spanner wrenches in a small fabricated box mounted on the rearward wall of the hose fitting compartment	
44	1	Cab lift handle	Install manual cab lift handle on the forward wall of the hose fitting compartment.	
<b>COMPARTMENTS- Street side #1</b>				
45	1	Husqvarna 970 power saw w/ Fire hooks 12" chopper blade	Stowed in upper shelf	
46	1	Fire hooks 12" Chopper blade	On wall peg in upper shelf area	
47	1	Dessert Diamond 14" diamond blade	On wall peg in upper shelf area	
48	1	Tool kit for saw	Stowed on upper shelf	
49	1	1 gallon storage can for mineral oil supply one gallon of Amkus fluid	Stowed on shelf	
50	2	1 gallon gasoline safety can	Stowed on shelf	
51	1	Turtle Tile b.a.s.k. 1 cribbing kit	Stowed on shelf	
<b>Floor tray S-1</b>				
52	1	Amkus AMK-24 Spreader w/mounts	Mounted in bracket on tray	
53	1	Amkus AMK-21A Cutter w/mounts	Mounted in bracket on tray	
54	1	Amkus AMK-20R RAM	Mounted in bracket on tray	
55	1	Amkus GH2B-MCH mini simo power unit	Mounted in bracket on tray	
56	1	Amkus 20' extension hose red quick coupling	Mounted in bracket on tray	

57	1	Amkus 20' extension hose blue quick coupling	Mounted in bracket on tray	
58	1	set-Amkus Extended reach tips	Stowed on shelf	
59	1	Amkus RAM Accessory Kit	Stowed on shelf	
<b>Street side compartment 2</b>				
60	2	Sears Craftsman D handle scoop shovel	Install in fabricated bracket on shelf forward	
61	2	Sears Craftsman round point shovel w/D handle	Install in fabricated bracket on shelf forward. Bed inside Scoop shovel	
62	2	Unger UNG FP60C Squeegee w/pro handle	Install in fabricated bracket on shelf rear wall	
63	4	Aluminum handles for squeegees and brooms  NuWay 1 1/8" x 60" Metal Threaded handles	Install the four (4) handles for the squeegee heads and push brooms in a fabricated bracket on the tool board in compt. S2 above the squeegee heads at the top of the tool board. Notch out the divider between compartment S2 and S3 at the top to allow the handles to stick through into compartment S2.	
64	2	NuWay 1424-24" Prime Stiff Fiber Garage Broom	Install in fabricated bracket on upper shelf	
65	1	Akron 3488 Stream Shaper (2-1/2" x 2-1/2")	Install 2.5" EZ lock for Akron 4824 tip with 2380 playpipe on floor of compt. S2, just to rear of the 3488 stream shaper and stacked tips.	
66	1	Akron 2499 Deluge Tips	Install two (2) 2.5" male screw plates for 3488 stream shaper and 2499 deluge tips on floor of compt. S2, all the way forward.	

67	1	Akron 3443 Monitor w/4445 fixed gallonage monitor	Install bracket for 3443 Mercury Monitor on floor of compt. S2, just to rear of the 3488 stream shaper and stacked tips.	
<b>Street side compartment 3</b>				
69	1	Igloo 3 gallon cooler	Stowed on shelf	
70	1	Scott Air-Pak X3 w/snap change , standard harness, 5.5 system, EZ-Scape Pro fixed belt, EZ Scape System, 50' t-Safe rope, Crosby hook, F4 descender, standard regulator, Dual EBSS, SEMSII with Bluetooth, 5500 psi / 45 min. carbon fiber cylinder, AV300-HT face piece with Kevlar Head net and right Side Communications bracket.	Stowed on upper shelf	
71	1	Set four (4) U-Line Lighted collapsible traffic cones	Stowed on compartment floor	
72	1	Foam Appliance, Task Force Tips, UM-12	Stowed in lower compartment	
73	1	Super Vac #720GC Gas powered fan	Stowed in lower compartment	
<b>Curb side Compartments</b>				
<b>compartment 1</b>				
74		1-Streamlight 44551 Vulcan LED Light	Installed in charger on shelf. Charger should be direct wired.	
75		1-Sears Tool box	Stowed on shelf	
<b>Tools provided in tool box</b>				
76	2	14" aluminum pipe wrench		
77	1	Sears Craftsman standard pliers		
78	1	Klein Linemans pliers 9"		
79	2	Crescent 10" adjustable wrench		

80	1	Vise Grip 10" plier		
81	1	24 oz. Eastwing claw hammer		
82	1	Standard medium screwdriver		
83	1	Phillips screwdriver #2		
84	1	Hack saw		
85	1	Key hole saw		
86	1	Channel Lock pliers		
87	1	Akron ECR-10-4500 Cord Reel Light with 100' of Akron Seoprene 105 Yellow Cord – 12/3 Electric Cord w/20amp twistlock female connector on end and 20 amp twistlock receptacles in gang box with switch and wire guard for light & Mounting Bracket ECR-MT		
88	1	Akron ECRP-10-ELSS-XLAC 100' 12/3 cord and gang box	Stowed on floor of compartment	
89	1	Akron 25' shoreline cord w/20amp female twistlock	On hanger side wall	
90	1	Akron 12" pig tail 20 amp male twistlock to female house	On hanger side wall	
91	1	Akron 12" pig tail 20 amp male house to female twistlock	On hanger side wall	
92	1	Super Vac #720VR2 Electric powered fan	Stowed on floor of compartment	
93	1	Super Vac #200SE Smoke Ejector	Stowed on floor of compartment	
<b>Curb side compartment 2</b>				
94	1	set -Fire Hooks "Maximus" halligan w/Pigg axe married pair	Install a flathead axe and Halligan tool married pair in fab. bracket on the floor of compt. C2.	
95	1	McMaster – Car 5333T56 Electrical gloves	Stowed in bag	

96	1	Leather protective gloves #13785T16	Stowed in bag	
97	1	Glove bag for above #9645T	Stowed on shelf	
98	1	CMC 150' New England ½" Multiline III rope	In stuff bag	
99	1	CMC stuff bag for rope #430205 black	Stowed in compartment	
100	1	36" Gooseneck wrecking bar	Install the 36" wrecking bar on the tool board in compt. C2 in fab. brackets above the pry bars.	
101	1	Akron FSY-12 12 pound sledge hammer	Install the sledge hammer on the tool board in compt. C2 in fab. brackets at the bottom of the tool board.	
102	2	Akron PPB-51 pry bar	Install the pry bars on the tool board in compt. C2 in fab. brackets above the bolt cutters.	
103	1	HK Porter 18" 0090 MC bolt cutter	Install the 18" bolt cutter and the 36" bolt cutter on the tool board in compt. C2 in fab. brackets at the lower part of the tool board above the sledge hammer.	
104	1	HK Porter 36" 390MC bolt cutter	See above	
<b>Curb side compartment 3</b>				
105	4	Fire Innovations ladder belts Navajo III, One (1) 32-42 waist and three (3) 42-52 waist	Stowed on shelf	
106	1	R&B Standpipe Kit bag, Model 444YL	Stowed on shelf	
107	1	Task Force J25G200S 2.5" In Line gauge w/swivel	Stowed in HR bag	
108	2	Shot gun sprinkler stop	Stowed in HR bag	
109	1	Task Force 2.5" x 2.5" Gated Wye #AY5NJ-NJ	Stowed in HR bag	

110	1	Akron 583 Hose roller	Stowed in HR bag	
111	1	CMC 50' New England 3/8" Multiline (hose roller)	Stowed in HR bag	
112	2	Akron 78 Ladder Strap	Stowed in HR bag	
113	1	Light weight highrise line 2" on 2-1/2" couplings 100' red	Stowed on lower shelf using highrise straps	
114	2	Light weight highrise line 2" on 2 1/2" couplings 50' red	Stowed on lower shelf using highrise straps	
115	1	Light weight highrise 2 1/2' line on 2 1/2" couplings 50' red	Stowed on lower shelf using highrise straps	
116	1	Akron 2431 Saber Shutoff with 15/16" orifice	Attached to line	
117	1	Akron 4866 1.5" tip w/spinning teeth 175gpm @ 75 psi	Attached to line	
118	1	Akron 4836 2.5" Assault b/ a tip with pistol grip 250gpm @75psi	Attached to line	
119	4	Model BB065 high rise straps	See above	
<b>Rear Hose Compartment EHL</b>				
120	8	100' sections All American Kryptonite 4" supply line-orange storz couplings	EHL	
121	6	50' sections All American Supreme 3" fire line-Tan- NHT thread on 2 1/2" couplings	EHL	
122	1	Akron 4824 w/350 gpm @100 psi baffle and 2390 playpipe.	EHL	
<b>Rear ladder Compartment</b>				
123	1	Alco-Lite model FL-10 folding aluminum ladder with bracket shall be provided	Stored in upper left quadrant in fabricated boxed section	
124	1	Alco-Lite model PRL-14, 14' aluminum roof ladder shall be provided.	Stored in left side of compartment.	

<b>125</b>	1	Alco-Lite model PEL-28, 28' two section aluminum ladder shall be provided.	Stored in right side of compartment.	
<b>126</b>	1	Akron Brass 4' Oak Wood Pike Pole item WRO-USA with a standard USA hook shall be provided. The Wood Pike Pole shall be constructed of 1 1/2" red oak handle with the tip sized and tapered and finished with Linseed Oil.	Stored in tube in upper right of ladder compartment	
<b>127</b>	1	Akron Brass 6' Oak Wood Pike Pole item WRO-USA with a standard USA hook shall be provided. The Wood Pike Pole shall be constructed of 1 1/2" red oak handle with the tip sized and tapered and finished with Linseed Oil.	Stored in tube in lower compartment	
<b>128</b>	2	Akron Brass 8' Oak Wood Pike Pole item WRO-USA with a standard USA hook shall be provided. The Wood Pike Pole shall be constructed of 1 1/2" red oak handle with the tip sized and tapered and finished with Linseed Oil.	Stored in tube in lower compartment	
<b>129</b>	1	Akron Brass 10' Oak Wood Pike Pole item WRO-USA with a standard USA hook shall be provided. The Wood Pike Pole shall be constructed of 1 1/2" red oak handle with the tip sized and tapered and finished with Linseed Oil.	Stored in tube in lower compartment	
<b>130</b>		Akron Brass 12' Oak Wood Pike Pole item WRO-USA with a standard USA hook shall be provided. The Wood Pike Pole shall be constructed of 1 1/2" red oak handle with the tip sized and tapered and finished with Linseed Oil.	Stored in tube in lower compartment	

<b>Upper body compartments</b>				
131	2	Firequip Maxi-Flex PVC 6" x 10' sections of hard suction hose provided.	Stowed in street side compartment	
132	1	Junkin Stokes Basket – Plastic Model Number: JSA200  Flemming 35900PY UltraLoc with pins backboard	Stowed in Curb side compartment  Backboard stowed in stokes	
<b>Booster Compartment</b>				
133	1	TFT BH-BGT Impulse booster nozzle	Booster Reel	
134	2	100' sections of 800# tested booster hose with 1" NST pyrolite coupling	Booster Reel	
135	1	50' sections of 800# tested booster hose with 1" NST pyrolite coupling	Booster Reel	
<b>Rear Bumper</b>				
136	1	Akron 4836 2 1/2" High Range Assault Break apart nozzle with pistol grip.	Rear Pre-connect #1	
137	4	All American Supreme – 50' x 2" Tan Hose. Thread shall be NH on 2 1/2" Couplings. On the female couplings shall be stamped "STLFD"	Rear Pre-connect #1	
138	1	Akron 4865 Mid-Range Assault Breakapart Nozzle with Pistol Grip	Rear Pre-connect #2	
139	4	All American Supreme – 50' x 1 3/4" Tan Hose. Thread shall be NH on 1 1/2" Couplings. On the female couplings shall be stamped "STLFD"	Rear Pre-connect #2	

<b>Miscellaneous</b>				
<b>140</b>	1	There shall be one (1) pair of Cast Products model TMC1008-4 wheel chocks provided with the apparatus.	The wheel chocks shall be mounted in Cast Products model TMC 1010 mounting brackets. Location determined at pre-paint	
<b>141</b>	1	Antenna #1 Motorola Model HAF4017A		
<b>142</b>	1	GPS antenna for computer.  Mobile Mark SMD-3500 GPS antenna for computer.  Mobile Mark SMD-3500		
<b>143</b>	4	50' sections All American Supreme 3" fire line-Tan- NHT thread on 2 1/2" couplings		
<b>144</b>	4	All American Supreme – 50' x 2" Tan Hose. Thread shall be NH on 2 1/2" Couplings. On the female couplings shall be stamped "STLFD"		
<b>145</b>	4	All American Supreme – 50' x 1 3/4" Tan Hose. Thread shall be NH on 1 1/2" Couplings. On the female couplings shall be stamped "STLFD"		
<b>146</b>	2	100' sections All American Kryptonite 4" supply line-orange storz couplings		
<b>147</b>	8	5500 psi / 45 min. carbon fiber cylinders		
<b>148</b>	2	25' sections All American Kryptonite 4" supply line-orange storz couplings		

<b>149</b>	1	GETAC X500 Computer with Windows 10, Intel I5-4310M 2.7GHZ, 3MB cache, 128/512 SSD,	Laptop computer to be delivered to ESD MAINTENANCE upon acceptance of first unit.	

# QUOTE SHEET

(Place a copy of this sheet at the front of your bid proposal for the bid opening)

## A. Bid Price

- Pumper unit price as specified including loose equipment \$ \_\_\_\_\_
- Cost of Diagnostic laptop (GETAC X500) with software and cables included in price (potential deduct). This also includes all cable and software needed to troubleshoot, Engine, Transmission, ABS system and V-Mux system. Cost per-order rather than per vehicle. \$ \_\_\_\_\_
- Cost of one (1) additional Auxiliary Power Unit (APU) to be provided with entire order, rather than per vehicle. Quick disconnects shall be used when functional to allow for speedy replacement of unit. \$ \_\_\_\_\_

## B. Signature

- The bidder agrees that these quotes shall be binding and shall not be withdrawn before thirty (30) days after bid opening.

Date: \_\_\_\_\_

Name: \_\_\_\_\_

Signature \_\_\_\_\_