INVITATION TO BID

Sealed bids will be received by the City of Foley at Foley City Hall, 407 East Laurel Avenue, Foley, Alabama 36535 ***or*** P.O. Box 1750, Foley, Alabama 36536 until 2:00 p.m., Wednesday, November 7, 2018 for:

CUSTOM PUMPER

Requisition No. FD-110718

at which time and place they will be publicly opened and read. Specifications may be obtained at Foley City Hall, 407 East Laurel Avenue, Foley, Alabama, 36535, by calling (251) 943-1545, or, the bid may be downloaded from the City's website at http://www.cityoffoley.org.

To be eligible for consideration, bids must be submitted on complete original proposal forms found in the Request for Proposal package. **The specifications and all executed bid forms must be submitted in a sealed envelope, clearly marked, identifying the bid and the date of the bid opening.** It shall be the sole responsibility of the bidder to assure receipt of the bid at the Foley City Hall prior to the published time for the bid opening.

The City of Foley reserves the right to accept or reject any or all bids and to waive technical errors if, in the City's judgment, the best interests of the City will thereby be promoted.

Rachel Keith
Purchasing Agent
City of Foley, Alabama

BID FORM

CITY OF FOLEY, ALABAMA
OFFICE OF PURCHASING AGENT

REQUISITION NO. **FD-110718**
BIDS TO BE OPENED AT: **2:00 P.M.**
DATE: **WEDNESDAY, NOVEMBER 7, 2018**

Sealed bids will be received by the City of Foley, Alabama, at its office in Foley until the above date and time, and then opened as soon thereafter as practicable.

Rachel Keith
Purchasing Agent

****

SPECIFICATIONS: SEE ATTACHED

****

If you are unable to furnish an item as specified and desire to offer a substitute, give full description of the item. No errors will be corrected after bids are opened. Substitutions will be treated as "approved equivalent or equal" which is discussed in paragraph 1.05 of the bid documents *GENERAL CONDITIONS*. Please refer to Paragraph 1.05 prior to offering any substitutions. No prices shall include State or Federal Excise Tax. Tax exemption certificates furnished upon request. City reserves the right to accept or reject all bids or any portion thereof.

****

We are in a position to complete and deliver per the attached quote within _____ days after receipt of notice to proceed. Any attachment hereto is made and becomes a part of this inquiry and must be signed by Bidder.

I hereby affirm I have not been in any agreement or collusion among bidders or prospective bidders in restraint of freedom of competition, by agreement to bid at fixed price or to refrain from bidding, or otherwise.

THIS BID MUST BE NOTARIZED
Sworn to and subscribed before me
this the _____ day of
_____, 2018.

_____
NOTARY PUBLIC

BIDS MADE OUT IN PENCIL WILL NOT BE ACCEPTED.

FIRM: _____

BY: _____
Signature accepted in ink only

STREET ADDRESS: _____

CITY: _____ STATE: _____

TERMS: _____
FOR CASH PAYMENT WITHOUT REGARD TO DATE OF REMITTANCE

ALL BIDDERS MUST USE OUR BID FORM(S). REQUISITION NUMBER AND OPENING DATE AND TIME MUST BE PRINTED ON THE OUTSIDE OF THE SEALED ENVELOPE. EACH BID MUST BE IN SEPARATE ENVELOPES.

BIDDER'S INFORMATION:

Bid Requisition Number:	**FD-110718**
Bid Name:	**CUSTOM PUMPER**

Company Name:	
Submitted By:	
Mailing Address:	
Telephone Number:	
Fax Number:	
E-Mail Address:	

ADDENDUM ACKNOWLEDGEMENT:

Bidder acknowledges receipt of the following addendums and has incorporated the requirements of such addendums into the bid.

(List all addendums issued for this bid.)

No.	Date

No.	Date

No.	Date

No.	Date

No.	Date

No.	Date

ADDITIONAL INFORMATION:

All questions related to this bid must be documented through email and should be sent to Rachel Keith at rkeith@cityoffoley.org no later than 72 hours prior to the scheduled bid opening. No questions will be addressed by any means other than email. Answers will be emailed to all bidders in the event that clarification is required. If further clarification is needed about a particular product bid or change within the bid, an Addendum will be emailed stating the change.

INSTRUCTIONS TO BIDDERS:

To be eligible for consideration, bids must be submitted on complete original forms found in the Invitation to Bid package. **The entire bid packet and all executed bid forms must be submitted in a sealed envelope, clearly marked, identifying the bid and the date of the bid opening.** It shall be the sole responsibility of the bidder to assure receipt of the bid at the Foley City Hall prior to the published time for the bid opening.

Bids should be sent to one of the following addresses:

U.S. Postal Service
City of Foley
Attn: Purchasing Agent
P.O. Box 1750
Foley, AL 36535

Physical Address
City of Foley
Attn: Purchasing Agent
407 E. Laurel Avenue
Foley, AL 36536

FOLEY
FIRE DEPARTMENT

CUSTOM PUMPER
SPECIFICATIONS

October 11, 2018

INTRODUCTION
PROPOSAL REQUIREMENTS

GENERAL INFORMATION

It is the intent of these specifications to secure apparatus constructed to withstand the severe and continuous use encountered during emergency firefighting services. The apparatus must be of the latest type, carefully designed and constructed with due consideration to the nature and distribution of the load to be sustained. The apparatus shall be a 2020 year model.

These specifications detail the requirements for general design criteria of cab and chassis components, aerial device, fire pump and related components, water tank, fire body, electrical components, painting, and equipment. In evaluating the bid proposals to determine which proposal is the most advantageous, these major items shall be considered.

Apparatus and equipment must meet the specific requirements and intent of the requirements as specified herein. All items of these specifications shall conform to the character of the proposed apparatus and the purpose for which it is intended. Criteria as specified by the National Fire Protection Association Pamphlet No. 1901, latest edition, entitled "Suggested Specifications for Motor Fire Apparatus", as approved by the American Insurance Association and International Association of Fire Chiefs, are hereby adopted and made a part of these specifications the same as if they were written out in full, insofar as they apply and are not specifically modified in the following detailed specifications. Each bidder shall provide only that equipment as required in the following specifications.

The fire apparatus and equipment to be furnished in meeting these specifications must be the products of an established, reputable fire apparatus and/or equipment manufacturer. Each bidder shall furnish satisfactory evidence of the manufacturer's ability to construct, supply service parts and technical assistance for the apparatus specified. Each bidder must state the location of the factory and location for post delivery service.

BID COMPLIANCE INSTRUCTIONS

Each bidder must indicate his compliance with these specifications by marking "YES" or "NO" in the appropriate column for each individual paragraph of this specification. Indicating "YES" to a paragraph shall mean full compliance; indicating "NO" shall mean an exception is being taken. Any deviation from the specification, no matter how small, must be so annotated. All exceptions must be fully explained on a separate page, titled "Exceptions", giving reference to the page and paragraph where the exception is being taken. Failure to comply with this requirement shall result in the bid proposal being rejected.

The Foley Fire Department shall be the sole arbiter as to what exceptions may be allowed or disallowed. In the event a bidder fails to make any indication of compliance for any or all provisions it will be assumed that the bidder is taking total exception to the specification and the bid shall be disallowed.

FIRE APPARATUS DOCUMENTATION

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

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

- Owners name and address

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

The pump manufacturer's certification of suction capability

A copy of the apparatus manufacturer's approval for stationary pumping applications

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

The pump manufacturer’s certification of hydrostatic test.

The Underwriters Laboratory certification of inspection and test for the fire pump (if applicable).

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

Written load analysis and results of electrical performance tests.

The certification of water tank capacity by the tank manufacturer.

The chassis shall be certified by the apparatus manufacturer as conforming to all applicable Federal Motor Vehicle Safety Standards in effect at the date of contract. This shall be attested to by the attachment of a FMVSS certification label on the vehicle by the contractor who shall be recognized as the responsible final manufacturer.

VEHICLE RECORDS

The successful bidder shall be responsible for preparing and maintaining a record file of parts and assemblies used to manufacture the apparatus. These records shall be maintained in the factory of the bidder for a minimum of twenty (20) years. File shall contain copies of any and all reported deficiencies, all replacement parts required to maintain the apparatus, and original purchase documents including specifications, contract, invoices, incomplete chassis certificates, quality control

reports and final delivery acceptance documents. The Foley Fire Department shall have access to any and all documents contained in this file upon official written request.

BIDDER INSTRUCTIONS

Bids shall be addressed and submitted in accordance with the advertised "Bid Notice". The words "Fire Apparatus Bid", the date, and the bid opening time must be stated on the face of the bid envelope. It is the bidder's responsibility to see that their proposals arrive on time. Late proposals, telegram, facsimile or telephones bids shall not be considered.

Each bid shall be accompanied by a detailed description of the apparatus and equipment it proposes to furnish. It is the intent of these specifications to cover the furnishing and delivery of a complete and soundly engineered apparatus equipped as specified. 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.

Brand names or model numbers have been specified for some items. These have been carefully selected because of their reliability and availability for replacement locally. In order to be most responsive, items named, or an item "equal to" the particular item specified by brand name or model, should be contained in the bid proposal. It is the bidder's responsibility to prove to the Foley Fire Department that an item bid as "equal to" a particular specified item, is truly of equal quality, design, and function. The Foley Fire Department maintains the right to make a final decision as to the acceptability of an item bid as "equal to" a particular specified item.

No exception shall be allowed for any of the aforementioned instructions. Bids not submitted in accordance with these instructions shall be rejected.

TIMELY PROPOSALS

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

GENERAL CONSTRUCTION

The complete apparatus, assemblies, subassemblies, component parts, etc., shall be designed and constructed with the due consideration to the nature and distribution of the load to be sustained and to the general character of the service to which the apparatus is to be subject. All parts of the apparatus shall be designed with a factor of safety, which is equal to or greater than that which is considered standard and acceptable for this class of equipment in firefighting service. All parts of the apparatus shall be strong enough to withstand general service under full load. The apparatus shall be so designed that the various parts and readily accessible for lubrication, inspection, adjustment and repair. Bidder's specifications must meet minimum requirements of N.F.P.A. Pamphlet #1901; Underwriters Laboratories, Inc.; and all State and Federal Department of Transportation vehicle regulations at time of sale of unit.

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

PRODUCT LIABILITY INSURANCE

Each bidder shall supply proof of product liability and facility insurance equal to or exceeding $30,000,000.00. This shall be provided as part of the proposal.

SINGLE-LINE RESPONSIBILITY

Since the Foley Fire Department desires to eliminate divided responsibility on the part of the manufacturers, only manufacturers who build their own fire apparatus cab, chassis, body and aerial device shall be considered. The apparatus must be built and painted in a facility owned and operated by the bidder by a staff that is directly employed by the bidder. At least fifteen similar units must have been sold and delivered of the type described herein. The entire apparatus (to include cab, chassis, body, pump, water tank and aerial device) MUST be manufactured in the United States! NO EXCEPTION SHALL BE ALLOWED TO THIS REQUIREMENT!

The bidder shall state if single line responsibility is being proposed.

Yes/No: _____

ADDENDA AND INTERPRETATIONS

No interpretation of the meaning of the specifications or other contract documents shall be made to any Bidder verbally. Every request for such interpretation shall be in writing and addressed to the Purchaser, and must be received at least ten days prior to the date fixed for the opening of the bids to be given consideration. Any and all such interpretations and any supplemental instructions shall be in the form of written addenda to the specifications which, if issued, shall be mailed by certified mail to all prospective Bidders not later than five days prior to the date fixed for the opening of bids. Failure of any Bidder to receive any such addendum or interpretation shall not relieve any Bidder from any obligation under his bid as submitted. All addenda so issued become a part of the contract documents.

SERVICE CENTER AND PARTS DEPOT

The manufacturer shall have an authorized service center, with a staff of factory-trained mechanics, well versed in all aspects of service for all major components, of the apparatus within a 300-mile radius of the Purchaser. In addition, the manufacturer shall maintain a separate service facility at the manufacturing site, in order to satisfy the need for possible major emergency service work.

SERVICE CENTER INFORMATION

The center must provide a full time staff of experienced technicians with all of the required equipment to provide modern, accurate and efficient service. Bidders shall state the size of their shop and officer area in square feet. They shall state the location of the facility and provide photos of both the exterior and interior of the center. Accuracy of the description of the service center is of great importance.

SPECIAL CONDITIONS

No bid shall be considered unless the bidder can meet the special conditions stated herein.

The complete apparatus must be manufactured in the United States of America.

PRICES AND PAYMENTS

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

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

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

Discounts for 100% pre-payment shall be provided in the bidder's proposal.

BID EVALUATION

Purchaser, Fire Chief and Purchasing Agent shall evaluate bids received. This evaluation shall be based as a minimum on the following criteria:

- Commitment for expedient delivery.
- Commitment to the general conditions contained herein, including warranty.
- Completeness of the proposal, i.e. the degree that it responds to all requirements and requests for information contained herein.
- Manufacturing and delivery schedule.
- Contractor's demonstrated capabilities and qualifications.
- Equipment suppliers and/or local representative's demonstrated capabilities and qualifications.

EXCEPTIONS TO SPECIFICATIONS

Exceptions shall be referenced to the paragraph and page of these specifications where the item appears. Drawings, photographs, and technical information about the exception shall be included as necessary. Any exceptions may be considered during the evaluation process, and the decision shall be final.

Proposals taking total exceptions to specifications shall not be accepted.

"OR APPROVED EQUAL" CLAUSE

The mention in the specifications of apparatus, equipment or material by brand name or by such specified description of same as is hereby made, is intended to convey to the bidder's understanding, the degree of excellence required. Any article, equipment, or material ,which shall conform to the standards and excellence so established, and is of equal merit, strength, durability and appearance to perform the desired function, is deemed eligible for offer as a substitute. The qualifications of the offering shall be judged as to their conformance with these specifications. Any equipment offered other than herein specified shall be subject to a competitive demonstration and evaluation shall be subject to a competitive demonstration and evaluation by the using department; such demonstration to be provided on request within ten working days after the receipt of bids.

The result of that demonstration and evaluation shall be of prime importance in the recommendation to the governing body for the final contract award.

TECHNICAL INFORMATION

Bidder shall furnish free of charge, upon request, technical information, graphs, charts, photographs, engineering diagrams, steering geometry, drive train certifications, instruction guides, or other documentation as requested to show that the equipment offered fully complies with these specifications.

PROPRIETARY PARTS

It is the intention of the Purchaser for all bidders to furnish the apparatus with major parts commonly used by the heavy-duty truck manufacturers and open market vendors whereas replacement parts are more readily available and at reduced cost.

The use of proprietary parts such as but not limited to axles, suspensions, engines, transmissions, frontal air bags, electronic controls, multiplexing systems, seats, pumps, gauges, foam systems, etc., may not be acceptable by the purchaser.

DELIVERY TIME

Each bidder shall state the completed apparatus delivery time based on the number of calendar days, starting from the date the sales contract is signed and accepted by the apparatus manufacturer. The completed apparatus shall be delivered no later than 9/30/2019 if a pre-pay option is exercised by the purchaser.

Delivery Time: _____ Calendar days

PENALTY CLAUSE

A penalty of $100.00 per day shall be assessed for each day beyond the proposed delivery date that the completed unit is not delivered. It is understood that this penalty clause excludes delays due to issues beyond the apparatus manufacturer and/or dealer's reasonable control, such as war, fire, labor disputes, acts of God, governmental regulations, or supplier issues.

Further, any changes requested after order submittal, including those made during the pre-construction conference, may void any penalty clauses or require that delivery and penalty be re-negotiated in good faith by both parties.

BOND REQUIREMENTS

Any bonds or sureties (bid, performance, or other) required by the Purchasing Organization shall be as specified below or as requested in the advertised "Bid Notice".

A bid bond shall be submitted with the bidder's proposal. The bond shall be for an amount equal to 10% of the proposed bid price. Failure to provide an original, acceptable, valid bid bond with the proposal shall result in the immediate rejection of the bidder's proposal.

The apparatus manufacturer must provide all bonds; bonds provided by a sales representative, dealer, distributor, or agent of the apparatus manufacturer, are not acceptable.

With respect to the qualifications of proposed bonds or sureties, the bidder's bonding company must meet the following requirements:

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

PERFORMANCE BOND

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

FAIR, ETHICAL AND LEGAL COMPETITION

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

NON-COLLUSIVE BIDDING CERTIFICATION

By submission of this bid, each bidder and each person signing on behalf of any bidder, certifies, and in the case of a joint bid, each party thereof certifies as to its own organization, under penalty of perjury, that to the best of their knowledge and belief:

- The prices in this bid have been arrived at independently without collusion, consultation, communication, or agreement, for purpose of restricting competition, as to any matter relating to sale price with any other bidder or any competitor.
- Unless otherwise required by law, the prices that have been quoted in this bid have not been knowingly disclosed by the bidder and shall not knowingly be disclosed by the bidder prior to opening, directly or indirectly, to any other bidder or to any competitor.
- No attempt has been made by the bidder to induce any other person, partnership, or corporation to submit or not to submit a bid for the purpose of restricting competition.
- That all requirements of the law including amendatory provisions as to non-collusive bidding have been complied with.

MATERIAL AND WORKMANSHIP

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

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

CONTRACT AWARD

The Purchaser reserves the right to reject any or all bids deemed to be unresponsive. The Purchaser also reserves the right to waive any informalities, irregularities and technicalities in procedure.

The Purchaser reserves the right, before awarding the contract, to require a bidder to submit evidence of his qualifications as may be deemed necessary. Documentation, which may be required, is financial soundness, technical competency, and other pertinent qualifications of a bidder, including past performance (experience) with the Purchaser.

Upon award of contract, the sales contract shall be between the Purchaser and the manufacturer of the apparatus. Contracts between the Purchaser and a sales representative, dealer, distributor, or agent of the apparatus manufacturer shall not be acceptable. (No Exceptions.)

CONTRACT SPECIALIST

The successful bidder shall designate a contract administrator to provide a single point interface between the purchaser and the contractor on all matters concerning the contract.

APPROVAL DRAWING

A detailed drawing of the apparatus shall be provided to the purchaser for approval before construction begins. A copy of this drawing shall also be provided to the manufacturer's

representative. Upon purchaser's approval, the finalized drawing shall become a part of the total contract.

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

INSPECTION VISITS

The successful bidder shall provide two (2) factory inspection trips to the apparatus manufacturer's facility. Transportation, meals, lodging, and other requisite expenses shall be the bidder's responsibility.

Accommodations shall be for two (2) Fire Department representatives per trip.

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

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

Travel arrangements greater than 300 miles from the manufacturing facility shall be via commercial airline transportation.

The Foley Fire Department maintains the right to inspect the apparatus, within normal business hours, at any other point during construction. Expenses incurred during non-specified inspection visits shall be the responsibility of the Foley Fire Department.

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

INSTRUCTION MANUALS/DRAWINGS, SCHEMATIC

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

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

The manual shall contain the following:

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

VEHICLE FLUIDS PLATE

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

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

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

PRIMARY PLANT CONSTRUCTION

In order to insure top quality construction, maximum assembly line and engineering communication and the highest level of manufacturing supervision the entire apparatus shall be built at the bidders' primary (headquarters) manufacturing facility. Apparatus constructed at satellite plants will not be considered.

REQUIRED PROPOSAL BLUEPRINT

A scale drawing of the specific apparatus being proposed shall be submitted WITH THE BID. Drawings of similar units or demo units shall not be permitted. Bidders should be clear that this provision is requiring a SCALE drawing of the truck which is actually being bid. The drawing shall be done at the manufacturer's facility by the manufacturer's engineering department in order to guarantee the accuracy of the drawing. Failure to comply with this requirement shall be grounds for rejection of the bid!

BODY CONSTRUCTION LIMITATIONS

Apparatus bodies which are either bolted together or make excessive use of adhesives shall not be considered. Similarly, body construction techniques which rely upon space consuming extrusions for structural support shall not be permitted.

FAMA COMPLIANCE

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

U.S.A. MANUFACTURER

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

QUALITY MANAGEMENT

The manufacturer shall operate a Quality Management System that is certified to ISO 9001 by an organization that is accredited by the ANSI-ASQ National Accreditation Board (ANAB).This type of business management system shall allow the manufacturer to monitor processes to ensure they are effective; keep adequate records; check output for defects, with appropriate and corrective action where necessary; regularly review individual processes and the quality system itself for effectiveness; and facilitate continual improvement.

A copy of the registration certificate must be included in the proposal, NO EXCEPTIONS.

TABLE OF CONTENTS

As all manufacturers present their specifications in a different order, each manufacturer shall provide a table of contents for ease of bid comparison and to clearly locate all proposed items.

STEPPING, STANDING, & WALKING SURFACES

All stepping, standing, and walking surfaces on the body shall meet NFPA #1901 anti-slip standards. Aluminum tread plate utilized for stepping, standing, and walking surfaces shall be Alcoa No-Slip type. This material shall be a minimum 3/16 (0.1875") in thickness. Upon request by the purchaser, the manufacturer shall supply proof of compliance with this requirement. All vertical surfaces on the body, which incorporate aluminum tread plate material, will utilize the same material pattern to provide a consistent overall appearance.

AMP DRAW REPORT

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

A written load analysis, which shall include the following:

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

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

COOPERATIVE PURCHASING

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

UNDERWRITERS LABORATORIES INC. (UL) EXAMINATION AND TEST PROPOSAL

If required by the specific chapters of NFPA-1901, the proposed unit shall be tested and certified by Underwriters Laboratories Inc. (UL) Underwriters Laboratories Inc. (UL) is recognized worldwide as a leading third party product safety certification organization for over 100 years. UL has served on National Fire Protection Association (NFPA) technical committees for over thirty years.

INDEPENDENT TESTING ORGANIZATION QUALIFICATIONS

- UL is a nationally recognized testing laboratory recognized by OSHA.
- UL complies with the American Society for Testing and Materials (ASTM) Standard ASTM E543 "Determining the Qualifications for Nondestructive Testing Agencies."
- UL has more than 40 years of automotive fire apparatus safety testing experience and 16 years of factory aerial device testing and Certification experience. UL has more than 100 years of experience developing and implementing product safety standards.
- UL does not represent, is not associated with, nor is in the manufacture or repair of automotive fire apparatus.
- All test work for fire pumps outlined in NFPA 1901, Edition shall be conducted.
- UL has included a list of all factory aerial device manufacturers for whom testing is currently being conducted on a regular basis.
- UL carries ten million dollars in excess liability insurance for bodily injury and properly damage combined.

UL provides the manufacturer a complete written examination and test report for each inspection performed at the manufacturer's facility. This report specifies the points of inspection and results of such examinations and tests.

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

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

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

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

When the unit successfully meets all the requirements outlined in NFPA 1901, 2016 Edition, UL shall issue a Certificate of Automotive Fire Apparatus Examination and Test stating the unit's compliance with NFPA- 1901.

FOAM PROPORTIONING SYSTEM CERTIFICATION

When the unit successfully meets all the requirements outlined in NFPA 1901, 2009 Edition, UL shall issue a Certificate of Automotive Fire Apparatus Examination and Test stating the unit's compliance with the required foam proportioning section of NFPA.

GENERAL APPARATUS DESCRIPTION "PUMPER"

The unit shall be designed to conform fully to the "Pumper Fire Apparatus" requirements as stated in the NFPA 1901 Standard (2016 Revision), which shall include the following required chapters as stated in this revision:

- Chapter 1 Administration
- Chapter 2 Referenced Publications
- Chapter 3 Definitions
- Chapter 4 General Requirements
- Chapter 5 Pumper Fire Apparatus
- Chapter 12 Chassis and Vehicle Components
- Chapter 13 Low Voltage Electrical Systems and Warning Devices
- Chapter 14 Driving and Crew Areas

- Chapter 15 Body, Compartments and Equipment Mounting
- Chapter 16 Fire Pumps and Associated Equipment
- Chapter 18 Water Tanks

CAB SAFETY SIGNS

The following safety signs shall be provided in the cab:

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

CHASSIS DATA LABELS

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

Fluid Data

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

Chassis Data

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

Manufacturers weight certification:

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

ROLLOVER STABILITY

The apparatus shall meet the criteria defined in 4.13.1 for rollover stability as defined in the 2016 NFPA Standard for Automotive Fire Apparatus.

PRINCIPAL APPARATUS DIMENSIONS & GVWR

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

BIDDER TO SUPPLY AND FILL- IN PROPOSED DIMENSIONS:

- OVERALL LENGTH: _____"
- OVERALL WIDTH: _____"
- OVERALL HEIGHT: _____"
- WHEELBASE: _____"

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

- MINIMUM FRONT G.A.W.R.: _____ lbs.
- MINIMUM REAR G.A.W.R.: _____ lbs.
- MINIMUM TOTAL G.V.W.R.: _____ lbs.

SEAT BELT ANCHOR TESTING

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

SEAT MOUNTING TESTING

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

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

PREDATOR "PANTHER"

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

"PREDATOR™ PANTHER" CAB TYPE

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

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

Cab shall be designed, fabricated, assembled in its entirety, and installed on the frame rails in the manufacturer's factory. This requirement will eliminate any split responsibility in warranty and service.

OPEN SPACE DESIGN

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

CAB MATERIAL - ALUMINUM

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

- Cab side panels 0.125 thick (1/8")
- Cab roof 0.125 thick (1/8")
- Forward cab front sheet 0.125 thick (1/8")
- Interior cab panels 0.125 thick (1/8")
- Other panels 0.125 thick (1/8")
- Cab doors 0.1875 thick (3/16")
- Engine enclosure side panels 0.250 thick (1/4")

CAB - BASE CONSTRUCTION

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

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

CRASH TESTING CERTIFICATION

To ensure the safety of the cab occupants and cab integrity, proof of third party testing shall be provided. The cab shall be certified for SAEJ2422 side impact, SAEJ2420 with ECER29 cab front impact, and ECER29 cab roof strength.

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

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

ROOF AND SIDE LOAD TESTING

The cab design will include additional third party testing to ensure the safety of the cab occupants and cab integrity, proof of third party testing shall be provided. The cab shall be certified for SAEJ2422 side impact, SAEJ2420 with ECER29 cab front impact, and ECER29 cab roof strength.

The manufacturer shall provide proof that third party testing has been conducted to prove a static roof and a static side-load test has been completed. In these tests, a 120,000 pound static load was first applied to the roof. This test was followed by applying the same 120,000 pound static load to the side of the cab.

These tests will be conducted per the SAE J2422, Cab Roof Strength Evaluation, protocol and the ECE R29, Uniform provisions concerning the approval of vehicles with regard to the protection of occupants of the cab of a commercial vehicle, protocol.

During both tests, the cab will withstand these loads without encroachment into the occupant survivable space and all doors remained closed during the test. The tests will be documented with photographs and real-time video in a report provided to the manufacturer.

DIMENSIONS - MEDIUM FOUR DOOR STYLE CAB

Minimum Cab Dimensions:

- Overall width 100"
- Inside width across ceiling 92"
- Front area floor to ceiling 62"
- Crew seat area width 92"
- Outer crew seat risers to rear wall 42"
- Centerline front axle to back of cab 62-1/2"
- Centerline axle to front of cab 74”

- Top of front seat to ceiling 44" (depending upon seat type)
- Seat back to steering wheel 22" (depending upon seat type)
- Inside width (door to engine enclosure) 27" (driver's side, at floor)
- Inside width (door to engine enclosure) 24" (officer's side, at floor)
- Floor to top of engine enclosure 27
- Front cab floor to top of center dash 34-3/4"

Glass Area Dimensions:

- Windshield (Contour) 3,422 sq. in.
- Front door window, retractable 743 sq. in. each
- Rear door window, retractable 875 sq. in. each
- Fixed side windows 620 sq. in. each

Cab Entry Door Width Dimensions

- Forward door opening 40" wide
- Rear door opening 37" wide

Cab Entry Step Dimensions

- Forward door recessed step 32" wide x 9" deep
- Rear door recessed step 32" wide x 9" deep

Cab Entry Door Height Dimensions

- Forward door opening 76-1/4" high
- Rear door opening 85-1/4" high

CAB ROOF

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

The cab roof over the rear crew area shall be raised ten (10) inches higher than the front driver and officer area. The front face of the raised roof section shall be sloped at a 45 degree angle, creating a streamlined interface with the standard, lower, forward roof section. This design shall allow for additional interior height in the rear crew area.

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

Approximate dimensions:

- Crew area floor to ceiling 64"
- Top of crew seat to ceiling 46" (depending upon seat type)

CAB ROOF OVERLAY

A bright finish aluminum tread plate overlay shall be placed on the cab roof. This overlay shall be placed on the raised roof section, or if a flat roof cab is being utilized, from the area of the “B” post area-rearward, and extending back to the end of the cab roof. This tread plate overlay {will/shall} be sealed with caulking around the edges to prevent moisture from entering the area between the cab roof and the overlay.

CAB ROOF DRIP RAIL

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

STEPWELL BATTERY ACCESS DOORS

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

CAB DOORS

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

The forward cab door opening shall be a minimum of 40" wide, and the rear cab door opening shall be a minimum of 37" wide. The rearward cab doors shall have a radius cutout allowing the door opening to protrude forward over the cab wheel well, while providing full access to the rear crew area.

There shall be a heavy duty piano type stainless steel hinge on each door with a minimum pin diameter of 5/16". Hinges shall be slotted for ease of horizontal and vertical adjustment. There shall be a cab door seal and the doors shall close flush with the side of the cab. A heavy-duty 6" wide belting material shall be utilized to prevent the cab doors from opening greater than 90 degrees.

ENTRY STEP AREA

Each of the forward entrance steps shall be a minimum of 8-1/2" deep with the floor board recessed a minimum of 5" to avoid "shin knocking". Each step shall be a bolt-in cast aluminum step.

Each of the rear entrance steps shall be a minimum of 8-1/2" deep. An intermediate step shall be provided between the lower entrance step and the crew area floor for ease of entry and egress. Each step shall be fabricated as an integral part of the cab construction. The cab step risers shall be painted to match the cab exterior color.

Each lower step shall be a bolt-in cast aluminum step.

DOOR LATCHES

A semi-recessed chrome plated pull handle, capable of operating with a gloved hand, shall be provided on the exterior of each cab door. Heavy-duty, bright finish cast paddle latches shall be provided on the interior of each cab door. Door latch mechanisms which utilize spring steel clamps shall not be considered due to their tendency to both rust and break. The interior door latch cables are to be designed to reduce adjustment or possible wear at the adjustment turnbuckles.

LOCKING CAB DOORS

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

The specified door lock cylinders shall be equipped with #2001 keys.

DOOR WINDOWS

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

DOOR WINDOW TRIM

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

WINDOW SCUFF PLATES

A polished stainless steel scuff plate shall be provided on the interior of each door, below the window.

INNER DOOR PANELS

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

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

CAB DOOR FRAME AND JAMB SCUFF PLATES

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

EXTERIOR CAB WALL OVERLAY

A bright finish aluminum tread plate overlay shall be provided over the entire exterior rear cab wall. The tread plate overlay shall be sealed with caulking around the edges to prevent moisture from getting between the cab and the overlay.

WINDSHIELD/GLASS

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

The windshield will be a contour design with 3422 sq. in. of area for improved visibility and style. The windshield glass shall be designed so it can be used on either the driver or officer side. Single piece windshields that utilize epoxy or that are bonded to the cab structure shall not be acceptable.

WINDSHIELD WIPERS AND WASHER

Dual, electric operated, pantographic type windshield wipers shall be provided. One (1) electric drive motor shall be provided for each wiper.

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

Windshield washers shall be electric operated wet-arm type with a 3/4 gallon washer fluid reservoir, mounted inside the engine enclosure and readily accessible through the engine hatch at the rear of the engine enclosure. The washer control shall be integral with the intermittent wiper control switch.

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

WINDSHIELD WIPER DURABILITY CERTIFICATION

Windshield wipers shall survive testing in excess of 3 million cycles in accordance with section 6.2 of SAE J198 “Windshield Wiper Systems – Trucks, Buses and Multipurpose Vehicles”. The bidder shall certify that the wiper system design has been “Third party tested” and that the wiper system has met these criteria.

CAB SIDE VIEWING WINDOWS

A fixed, tinted window with 620 sq. in of glass area shall be provided on each side of the cab behind the forward cab doors. This window will be the same height as the window in the rear cab door for maximum visibility.

STATIONARY VIEWING WINDOWS

Two (2) 22"H x 6"W stationary viewing windows shall be provided on the rear wall of the cab, one (1) each side, at the outboard edge. Each window shall be installed with an aluminum flange.

DARK TINTED REAR WINDOW GLASS

The windshield and the forward cab door glass shall be provided with standard DOT green automotive tint. The side cab windows to the rear of the front doors, the rear cab door windows and any rear viewing windows shall be equipped with a dark automotive tint.

GRAB HANDLES

Two (2) 1-1/4" diameter x 28" long, knurled bright anodized aluminum handrails shall be provided, one (1) at each front cab door entrance. Two (2) 1-1/4" diameter x 48" long, knurled, bright anodized aluminum handrails shall be provided, one (1) at each cab rear door entrance and run all the way up to the bottom of the PSTANK gauges. Grab rail stanchions shall be chrome plated and offset when necessary to prevent "hand-pinching" when opening or closing the doors. Formed rubber gaskets shall be provided between each stanchion base and the cab surface.

INTERIOR GRAB RAILS

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

- One (1) 11" long, horizontally mounted, on each front cab door on the upper interior door panel
- One (1) 12" long, vertically mounted, on the officer's side "A" post
- One (1) 11" long, horizontally mounted, on each rear cab door on the interior door panel
- One (1) 30" long, horizontally mounted, on each rear cab door, located approximately 8" above the bottom of the window opening
- Two (2) 12" long, vertically mounted, one (1) each side of the cab interior on the “C” post in the crew area

FRONT CAB GRILL

A SQUARE mirror finished stainless steel grille shall be installed to allow for maximum air flow to the charge air cooler and the radiator.

AIR INTAKE/OUTLET

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

with a mesh screen to serve as a secondary ember separator. The design shall permit proper ducting of air through the engine compartment and cooling system.

ENGINE AIR INTAKE SYSTEM

The left side inlet, used for the air intake to the air cleaner, shall be equipped with dual ember separators for separating burning embers from the air intake system. This system shall be such that particles larger than .039 inches (1 mm) in diameter cannot reach the air filter element.

No part of the air intake system for the engine shall be lower than the top of the frame rails to ensure the vehicle can navigate pooled water without any part of the air intake system being exposed to water when the vehicle is stopped or in motion. Chassis designs, which the engine air intake system is lower than the frame rails shall not be acceptable!

CAB WHEEL WELL LINERS

The front cab wheel wells shall be equipped with fully removable, bolt-in, aluminum inner wheel well liners. The liners shall extend full depth into the truck frame. The completely washable wheel well liners shall be designed to protect the cab substructure, inner panels, and other miscellaneous installed components from road salts, debris, dirt accumulation and corrosion.

CAB FENDERETTES

The cab wheel well openings shall be trimmed with replaceable, bolt-in, polished aluminum fenderettes. The fenderettes shall be secured to the cab with stainless steel threaded fasteners along the internal perimeter of the wheel well. Dissimilar metal tape and black vinyl trim molding shall be used where the cab and fender meet.

FRONT MUD FLAPS

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

FOLD STEPS REAR CAB WALL

A folding step shall be provided on the exterior rear wall of the cab, on the driver and officer side, to provide easy access to the pump house walkway. The steps shall mount approximately 13" from the bottom of the rear cab sheet and centered 6" from the outer edge of the cab. The step shall match the folding steps utilized on the apparatus body.

CAB RADIUS MOUNTED MIRROR

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

MIRROR CONTROL/S

To minimize wire circuits roughed from the dash to the door, the mirror position and heat (if applicable) controls shall be programmed into and controlled from the multiplex control screen.

INTERIOR TRIM

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

The forward overhead panel shall be a fabricated aluminum module painted to match the interior. This module shall contain the integrated windshield defroster/heater.

The headliner and rear cab wall shall utilize gray Durawear material, with padding underneath, to provide additional insulation.

The interior metal surfaces of the cab shall be finish painted the same color as the main exterior color.

INTERIOR REAR WALL

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

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

UNDER SEAT STORAGE COMPARTMENTS

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

BARYFOL FLOORING

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

ENGINE ENCLOSURE

The forward portion of the engine enclosure shall be covered with a Durawear material formed overlay to match the balance of the cab interior. To allow maximum "elbow room" for the driver and officer, the forward portion of the engine enclosure shall feature a contour shape. The engine enclosure shall not significantly obstruct the driver's vision in any direction. The enclosure shall be an integral part of the cab structure, which shall be constructed from material providing adequate strength to support radio, map boxes, etc. The engine enclosure shall be insulated to protect from heat and sound. The noise insulation shall keep the DBA level within the limits stated in the current NFPA series 1901 pamphlet.

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

The enclosure shall be an integral part of the cab structure, which shall be constructed from a minimum of .25" 5052-H32 aluminum. This material shall be welded to the floor sub frame on each side of the cab and shall extend from the very front of the cab to the rear of the engine enclosure.

The rear section of the engine enclosure shall be reduced 8-1/2" in length to provide additional leg room for the forward facing seating position/s.

ADDITIONAL ENGINE ENCLOSURE INSULATION

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

SUN VISORS

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

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

DRIVERS SEAT

The driver's seat shall be a H. O. Bostrom Sierra Air-50FX/HD, high back bucket seat. The seat shall have a tapered and padded seat cushion with lumbar support.

The seat shall have a five inch fore and aft adjustment, a three inch height adjustment with heavy duty damper and a fixed seat back. The seat air ride suspension shall be pneumatically controlled from a control switch on the forward lower edge of the seat.

OFFICERS SEAT

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

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

The officer's seat base shall be reduced in length by approximately 3". The officer's seat shall be mounted as far back as functional.

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

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

REAR FACING, OUTBOARD, DRIVER SIDE SEAT

The driver's side outboard rear facing crew seat shall be a H. O. Bostrom Tanker 450 ABTS RH series fixed base SCBA seat. The seat shall have a tapered and padded seat cushion with lumbar support. The seat shall include a SCBA storage area with integral headrest.

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

The driver's side rear facing outboard seat shall include a H. O. BOSTROM Secure All™ SCBA Locking System. The bracket system shall be free of straps and clamps that may interfere with auxiliary equipment on SCBA units. The center guide fork shall keep the tank in-place for a safe and comfortable fit in seat cavity. Fire fighters shall simply push the SCBA unit against the pivot arm to

engage the patented auto-locking system. Once the lock is engaged, the top clamp shall surround the top of the SCBA tank for a secure fit in all directions.

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

REAR FACING, OUTBOARD, OFFICER SIDE SEAT

The officer's side outboard rear facing crew seat shall be a H. O. Bostrom Tanker 450 ABTS LH series fixed base SCBA seat. The seat shall have a tapered and padded seat cushion with lumbar support. The seat shall include a SCBA storage area with integral headrest.

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

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

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

CENTER FORWARD FACING CREW SEATS

Two (2) center inboard forward facing crew seats shall be provided. Each seat shall be H. O. Bostrom Tanker 450 ABTS series fixed SCBA seat and shall have a tapered and padded seat cushion with lumbar support.

Each seat shall include an SCBA storage area with integral headrest.

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

The two (2) center inboard forward facing crew seats shall have a flip-up style seat.

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

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

FORWARD FACING CREW SEAT RISER

The center forward facing seats shall be mounted on an aluminum riser that shall be mounted in the center of the cab. The riser shall match the interior of the cab and shall have open compartments with no doors.

SEAT UPHOLSTERY MATERIAL

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

3 POINT BELT, SINGLE RETRACTOR, HEIGHT ADJUSTER - DRIVER

The driver seating position shall be furnished with three-point, shoulder-type seat belt with single retractor (non ABTS) that shall include ADM, a height adjustment for the belt's "D" loop assembly. This adjustment shall optimize the seat belt's effectiveness and the firefighter's comfort.

SEAT BELT TETHER - AIR RIDE NABTS - DRIVER

An IMMI tether shall be supplied for the Non ABTS seat belt system with air ride.

SEAT ADJUSTMENT NOTICE

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

SEAT BELT CUSHION SENSORS AND BELT SENSORS

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

Seat belt and seat cushion sensors shall be provided on the six (6) specified seating positions.

VEHICLE DATA RECORDER

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

Data storage capabilities shall include interfaces with the following systems:

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

VEHICLE DATA RECORDER DOWNLOAD HARNESS

A Weldon model #0L40-2597-00 VDR download harness shall be supplied with the system to allow the data to be downloaded to a computer.

ANTENNA INSTALLATION

One (1) antenna mounting base(s) model #MATM with 17' of coaxial cable shall be provided and installed on the lower cab roof, behind the light bar. The attached antenna wire(s) shall be run to the AREA BEHIND THE OFFICER'S SEAT.

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

The Fire Department shall provide a cable(s) to be run from behind the officer's seat to the officer's overhead.

An AM/FM radio antenna shall be provided on the cab roof and shall terminate in the officer's overhead for a Fire Department installed radio.

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

DASH & CENTER CONSOLE

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

The instrument cluster shall be centered in front of the driver and all gauges shall be installed in a non-glare, pewter finish panel.

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

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

DRIVER'S DASHBOARD PANEL

The main instrument panel shall be centered in front of the driver and shall have a hinged bottom with two ¼ turn latches at the top. The panel shall be made of 1/8” aluminum with an anti-glare, pewter brushed surface and shall contain the primary gauges, an instrument warning light cluster and the ignition and engine start switches.

The lower portion of this panel can be used for the installation of up to five (5) guarded type rocker switches. Examples of the switches that shall be installed in this area are automatic chains, fan clutch over-ride, ATC mud-snow, inter-axle diff lock, electric fuel pump, all-wheel drive, etc.

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

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

The primary gauges shall consist of:

- Vehicle speedometer, (0-80 mph)
- Engine tachometer, (0-3000 rpm)
- Engine oil pressure, (0-100 psi); low oil warning
- Engine coolant temperature (100-280 °F); high engine temp warning
- Transmission oil temperature (100-350 °F); high transmission fluid temp warning
- Vehicle battery voltage (9-18 VDC); low voltage warning
- Front air system gauge (0-150 psi); low air pressure warning at 65 psi
- Rear air system gauge (0-150 psi); low oil pressure warning at 65 psi
- Fuel level (E - 1/2 - F); low fuel level warning
- Air cleaner restriction gauge (0-40), warning at 25"

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

- Diesel Exhaust Fluid level (E-1/2-F); low fuel level warning @ 1/8 tank
- Engine Compression Brake Controls
- Class One "Officer's Speedometer" (near officer's seating position)

CLASS 1 DISPLAY

An UltraView 450 4.3" display shall be provided on the dash for the electrical Class One ES-Key multiplex system. The exact location shall be determined by the totality of instruments and switches on the cab dash.

The screen shall be programmed with the following features:

- Chassis Instrument Display
- Seat Occupant Display
- HVAC Controls
- Power Mirror Controls
- DPF Filter Regeneration Controls

INDICATOR CLUSTER

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

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

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

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

On the Road displays include:

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

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

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

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

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

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

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

LOWER RIGHT AUXILIARY SWITCH PANEL

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

PUMP SHIFT CONTROL

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

The pump shift control shall be a Mil Spec toggle switch with mechanical detents mounted in a fully backlit panel that shall have indicators for "Pump Engage" and "Ok To Pump". The mode of the transfer case shall be controlled by remotely mounted air solenoids which shall be activated and monitored through the chassis control logic of the multiplex system.

MOBILE TERMINAL AREA

There shall be a flat surface area in front of the officer for placement of a laptop computer.

HEATER/DEFROSTER AND AIR CONDITIONING SYSTEM

The cab will be designed with a HVAC system shall be a dual roof mounted SGM air conditioning system capable of cooling a heat soaked cab interior.

The HVAC shall utilize one (1) International Components Engineering #TM-31 HD compressor, mounted as close to level as practicable. The compressor shall have a serpentine Poly "V" drive belt system installed in accordance with the compressor and belt manufacturer's requirements.

Air conditioning hoses and fittings shall be appropriately sized to the compressor and other specified air conditioning components. Minimum hose size, shall be #10 hose for discharge and #12 hose for suction. Steel hose end fittings shall be provided at the compressor. The air conditioner hose shall be the Aeroquip "Easy Clip" style hoses as recommended by Aeroquip. The A/C hoses shall utilize FC802 Aeroquip hose with re-usable JIC 37 degree fittings.

One (1) condenser, rated at a minimum of 72,000 BTU cooling and 104,000 BTU heating shall be provided on the cab roof. Both the front and rear overhead units shall include the heating units. (if applicable, the raised roof shall be equipped with notch to accommodate the condenser unit)

Two (2) evaporators, with a minimum blower output of 720 CFM through the louvers shall be provided. Both evaporator units shall be mounted on the cab roof, enclosed by aluminum panels painted white. The evaporator louvers and controls shall penetrate the cab roof into occupant compartments to the least extent practicable. Fourteen (14) 3" diameter adjustable louvers shall be furnished, four (4) in the front crew area and eight (8) in the rear crew area of the cab. The A/C drain lines shall be routed to the inside of the cab wheel well area. Draining condensation into the interior of the cab or onto the occupants, roof or windshield will not be acceptable under any conditions.

The dual evaporator shall be roof mounted to allow service and maintenance without the need to remove interior components or upholstery.

System shall be compatible with R134A refrigerant.

The 12-volt system for the air conditioners shall have first priority to be load managed. The system shall utilize clearly labeled automatic reset-type circuit breakers.

The controls system shall actuate the air-distribution system with air cylinders, which are to be separated from the brake system by an 85-90 psi pressure protection valve.

The air conditioning system shall be configured to only operate when the vehicle's engine is running.

The blowers, in both evaporators, shall be in operation whenever the air conditioning system is activated.

Heater-defroster shall have a three-speed electric fan with a minimum output of 720 CFM through the louvers. Six (6) 3" diameter adjustable defroster outlets shall be provided for directing warm air to the windshields. An additional diffuser will be added to each corner of the front overhead, angled to the front door windows to assist with window defrosting. Heater-defroster unit controls shall be illuminated. Water lines from the engine to heater-defroster shall be 5/8" heater hose with readily accessible flexible connections at each end. The water lines to the heater shall have brass shut-off valves mounted on the engine to isolate the heater-defroster unit. The heater hose installation shall not incorporate a copper tube manifold.

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

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

Controls for this HVAC system shall be accessed and controlled through the Class One Ultraview screen located either in the cab overhead or on the dash wing panel, both of which shall be easily accessible by the driver.

Drains for the AC unit shall be ran between the rear wall skins and drain under the cab. The drains shall not protrude the rear wall and drain on the walkway area.

ROOF MOUNT CONDENSER

A 12-volt roof top dual condenser shall be strategically positioned on the cab roof so as not to interfere with any emergency lighting systems. The condenser shall be designed with high performance, long life fan assemblies. The fan motors are to be equipped with sealed housings and shaft.

The condenser and coil design shall include rifled tubing for maximum efficiency. Each coil shall be painted black. The condenser unit must include a receiver drier with a high and low pressure switch. The wire harness shall include necessary wiring for the clutch circuit as well as a separate power relay circuit.

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

CLIMATE CONTROL SWITCHES

The multiplex system control screen shall contain all controls for the cab HVAC system. The following controls shall be programmed into the control/display: mode selector switch, front fan speed switch, rear fan speed switch, air conditioning on/off switch, and temperature control dial.

CAB TILT ASSEMBLY

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

The cab tilt mechanism shall be custom designed for ease of maintenance and consist of two (2) hydraulic cylinders. Hydraulic lines shall be rated at 20,000 PSI burst pressure. The hydraulic cylinders shall be equipped with a velocity fuse that protects the cab from accidentally descending when the cab is in the tilt position.

Hydraulic cylinders shall be detachable to allow removal of the engine for major service. A remote cable operated mechanical cylinder stay bar and release shall be provided to insure a positive lock in the tilted position.

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

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

AUXILIARY MANUAL CAB LIFT

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

The auxiliary cab lift jack shall be mounted so that it is accessible by opening the officer's side upper pump panel service door. The auxiliary jack handle shall be mounted behind the panel in the area near the jack.

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

CHASSIS FRAME ASSEMBLY

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

The frame shall consist of two (2) channels fastened together by cross members. All structural fasteners used in the frame shall be Grade 8 hardware. Hardened steel washers shall be used under all bolt heads and nuts to avoid stress concentrations. Top flange shall be free of bolt heads. All spring hangers shall be machined steel castings. Frame assemblies that are welded or assembled with “Huck” type fasteners are not acceptable.”

Each main frame rail shall be 10-1/4" x 4" x 3/8", fabricated from Domex™ 110,000 PSI minimum yield steel, with a minimum section modulus of 18.396 cu in and a resisting bending moment (RBM) of 2,023,560 inch pounds. The frame rails shall be drilled “together” (back to back) on a frame drilling machine with an internally cooled drill bit in order to minimize the deviation in hole diameter or location. Frames are built for the specific apparatus under construction so that no unnecessary holes or modifications are made to the frame assembly.

A full length inner frame liner 9.44" X 3.63" X 3/8" shall be installed. Total section modulus of each rail, with liner, shall be 33.56 cu in and the total resisting bending moment (RBM) shall be a minimum of 3,691,050 in-lbs, per rail. NO EXCEPTIONS.

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

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

FRONT BUMPER

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

BUMPER EXTENSION

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

STORAGE WELL - CENTER

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

One (1) hinged, latched, aluminum tread plate cover shall be installed on the storage well located in the center of the bumper extension. A gas strut or struts shall be provided to hold the cover in the open position.

The tread plate hose well cover shall have a notch cut out to allow pre-connection of suction/discharge hose. The notch shall have rubber edging around it to protect the hose.

CENTER WELL - HOSE CAPACITY

The center storage well shall have the desired capacity of:

- 150' of 1 3/4" hose

FRONT TOW HOOKS

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

FRONT AXLE

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

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

FRONT BRAKES

Brakes shall be "S" Cam 16.5" x 6" and shall be full air actuated with automatic slack adjusters.

FRONT SUSPENSION

Front suspension shall be progressive rate front leaf springs. The spring shall be permanently pinned at the front and have a shackle double pinned mounting at the rear.

The front leaf springs shall have a minimum of 9 leaves, a minimum length of 51", and a minimum width of 3-1/2". The capacity at ground shall be 20,000 lbs., or exceed the capacity of the axle, unless specified to the contrary in this specification. All springs shall be of center bolt design. All springs shall be positively restrained from rotating in brackets and shackles.

FRONT SHOCK ABSORBERS

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

REAR AXLE

Rear axle shall be a single, Meritor RS-26-185 with a capacity of 27,000 lbs. (Minimum). Axle shall be a single reduction axle with hypoid gearing and oil-lubricated wheel bearings. Oil seals shall be provided as standard equipment.

REAR BRAKES

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

REAR AXLE TOP SPEED

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

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

REAR SUSPENSION

The rear suspension shall be leaf type, variable rate with a 31,000 lb. rating. The main spring assembly shall consist of 14 leaves with the main spring measuring 60.5" L x 3" W.

There shall be a rubber block helper mounted above the leaf springs, rated at 4,500 lbs. Two (2) fully wrapped leaves shall transmit driving and braking torque. The rating shall be designed to match or exceed the rear axle.

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

BRAKE SYSTEM

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

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

Cord reinforced rubber hose lines with brass fittings shall be installed from the frame rails to axle mounted air connections.

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

ABS SYSTEM

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

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

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

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

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

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

BRAKE AIR RESERVOIRS

There shall be a minimum of three (3) air reservoirs installed in conformance with best automotive practices. Reservoir capacity total shall be a minimum of 4693 cubic inches.

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

- Wet Tank Black
- Primary Tank Green
- Secondary Tank Blue

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

AIR DRYER SYSTEM

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

AIR LINES

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

AIR COMPRESSOR

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

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

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

BRAKE TREADLE VALVE

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

PARKING BRAKE

Parking brake shall be of the spring-actuated type, mounted on the rear axle brake chambers. The parking brake control shall be mounted on the cab center instrument panel, offset toward the

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

FRONT WHEELS & TIRES

The front wheels shall be 22.5" x 9" ten stud, hub piloted polished aluminum disc type.

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

The front tires shall be Michelin 315/80R22.5 "20 Ply" tubeless radial XZA2 E highway tread. The tires shall be fire service rated up to 19,452 lbs and shall have a top speed of 75 mph when inflated to 130 psi.

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

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

REAR WHEELS & TIRES

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

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

The rear tires shall be Michelin 315/80R22.5 "20 Ply" tubeless radial XZA2 ENERGY highway tread. The tires shall be fire service rated up to 35,396 lbs and shall have a top speed of 75 mph when inflated to 130 psi.

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

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

TIRE PRESSURE MONITORING DEVICES

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

The sensor shall calibrate to the tire pressure when installed on the valve stem for pressures between 10 and 200 psi. The sensor shall activate an integral battery operated LED when the pressure of that tire drops 8 psi.

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

ENGINE

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

- Max. Horsepower 450 HP @ 2100 RPM
- Governed Speed 2200 RPM

- Peak Torque 1250 lb. ft. @ 1400 RPM
- Cylinders Six (6)
- Operating Cycles Four (4)
- Bore & Stroke 4.49 x 5.69 in.
- Displacement 543 cu. in.
- Compression Ratio 16.6:1
- Governor Type Limiting Speed
- Drive line Size 1710

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

A fuel/water separator shall be provided.

ENGINE CHASSIS CERTIFICATION

The engine shall be installed in accordance with engine manufacturer's instructions. The apparatus manufacturer shall be able to furnish proof of engine installation approval by the engine manufacturer.

COOLING/RADIATOR

Radiator and charge air cooler shall be aluminum with welded aluminum top and bottom tanks. The cooling system shall be designed for a maximum of fifteen (15) PSI operation. There shall be a sight glass on the surge tank to check the coolant level without removing the radiator cap. The core construction shall be aluminum bar/plate. Fin density should be a maximum of ten (10) fins per inch.

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

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

The engine cooling system shall have an inline coolant filter that shall have a shut off valve for ease of maintenance.

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

TRANSMISSION COOLER

A shell and tube transmission oil cooler shall be provided using engine coolant to control the transmission oil temperature. The cooler shall have an aluminum shell and copper tubes. The cooler shall be assembled using pressed in rubber tube sheets to mechanically create a reliable seal between the coolant and the oil. No brazed, soldered, or welded connections shall be used to separate the coolant from the oil.

RADIATOR CROSSMEMBER

The radiator installation shall include a radiator crossmember for additional strength and durability. This crossmember shall be designed so the angle of approach is not effected.

CHARGE AIR COOLER

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

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

Where applicable, the charge air cooler pipes shall be constructed of appropriately sized aluminized steel tubing with 0.06" wall thickness and formed hose barbs. The connections between these pipes, the engine and charged air cooler, shall be made using high temperature silicone hoses rated for use in temperature up to 500°F, and heavy duty constant tension T-Bolt spring hose clamps. These connections shall adequately allow for movement of the engine relative to the charged air cooler.

COOLING SYSTEM FAN

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

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

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

COOLANT HOSE AND PIPING

All coolant piping shall be constructed of appropriately sized powder coated steel tubing with 0.06" wall thickness and formed hose barbs. All connections between coolant pipes and chassis components shall be made using appropriately sized silicone hoses or elbows, rated for use in temperatures ranging from -60°F to +350°F, and appropriately sized constant torque hose clamps. These connections shall be minimal in number to reduce the number potential leak points, and shall adequately allow for movement of the engine relative to chassis mounted components. All integral hoses supplied with the engine shall be as supplied by the engine manufacturer.

HEATER HOSES

Premium Goodyear Hi-Miler® blue heater hoses shall be furnished for the heater system. The Hi-Miler® hose shall have a core of black Versigard (EPDM) with spiral Flextan reinforcement and blue Versigard coating. All heater hoses shall be equipped with constant torque type hose clamps. All integral hoses supplied with the engine shall be as supplied by the engine manufacturer.

ENGINE BRAKE

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

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

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

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

ENGINE FAST IDLE

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

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

AIR CLEANER

An engine air cleaner shall be provided. The air cleaner shall include a dry type element and shall be installed in accordance with the engine manufacturer's recommendations. The air cleaner shall be located to the rear of the engine, with streamline air pipes and hump hose connections from the inlet to the air cleaner and from the air cleaner to the turbo. The air cleaner shall be easily accessible when the cab is tilted. The air cleaner shall be plumbed to the air intake system that shall include a self-sealing connection between the cab and air cleaner assembly to allow the cab to be tilted.

To draw fresh clean air, the intake for the air cleaner shall be on the side of the cab on the driver's side. The inlet shall be a minimum of 41" above the ground to allow the vehicle to navigate through water without any part of the air intake system being below the frame rail, preventing any type of water intake.

SPARK ARRESTOR

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

ACCELERATOR CONTROL

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

REMOTE THROTTLE CONTROL HARNESS

An apparatus interface wiring harness for the engine shall be supplied with the chassis. The harness shall include a connector for connection to the chassis harness which shall terminate in the left frame rail behind the cab for reconnection to required throttle control harnesses. The harness shall contain necessary connectors for a pressure governor and a multiplexed gauge. Separate circuits shall be included for pump controls, “Pump Engaged” and “OK to Pump” indicator lights, open compartment ground, start signal, park brake ground, ignition signal, master power, customer ignition, air horn solenoid switch, high idle switch and high idle indication light.

An apparatus interface wiring harness shall also be included which shall be wired to the cab harness interface connectors and shall incorporate circuits with relays to control pump functions. This harness shall control the inputs for the transmission lock up circuits, governor/hand throttle controls and dash display which shall incorporate “Pump Engaged” and “OK to Pump” indicator lights. The harness shall contain circuits for the apparatus builder to wire in a pump switch.

ENGINE PROGRAMMING REMOTE THROTTLE

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

TRANSMISSION

An Allison World Transmission, Model 3000 EVS electronically controlled, automatic transmission shall be provided. Transmission specifications shall be as follows:

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

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

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

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

- First 3.49:1
- Second 1.86:1
- Third 1.41:1
- Fourth 1.00:1
- Fifth 0.75:1
- Reverse -5.03:1

TRANSMISSION SHIFT SELECTOR

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

TRANSMISSION OIL LEVEL SENSOR

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

PARK TO NEUTRAL

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

PRESELECT PROGRAMMING

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

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

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

SYNTHETIC TRANSMISSION FLUID

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

DRIVE LINES

Drive lines shall be Dana (Spicer) 1710 heavy duty series or equal, with "glide coat" splines on all slip shafts. The manufacturer shall utilize an electronic type balancing machine to statically and dynamically balance all drive shafts. The manufacturer shall provide proof of compliance with all drive shaft manufacturer's standards and specifications.

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

DIESEL EXHAUST FLUID TANK

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

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

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

EXHAUST SYSTEM

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

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

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

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

Separate "regeneration" enable and prohibit switches shall be provided under the dash board on the driver's side. Each switch shall be provided with a spring loaded protective cover and shall be clearly marked as to function.

SELECTIVE CATALYTIC REDUCTION (SCR)

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

The SCR system shall reduce levels of NOx (oxides of nitrogen emitted from engines) by injecting small quantities of diesel exhaust fluid (DEF) into the exhaust upstream of a catalyst, where it

vaporizes and decomposes to form ammonia and carbon dioxide. The ammonia (NH3), in conjunction to the SCR catalyst, converts the NOx to harmless nitrogen (N2) and water (H2O).

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

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

FUEL TANK

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

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

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

The fuel tank shall be able to withstand a longitudinal acceleration of -23.0g at 0.166 seconds in accordance to SAE J211 standards using a channel frequency class 600 filter. Testing shall be performed at and verified by a third party testing and evaluation center.

FUEL TANK STRAPS

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

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

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

FUEL FILTER/WATER SEPARATOR

A Racor 400 series heated fuel filter/water separator shall be provided in the fuel system. A "water in fuel" indicator shall be provided on the dash.

SECONDARY ELECTRIC FUEL PUMP

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

FUEL POCKET

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

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

DUAL POWER STEERING

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

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

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

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

STEERING COLUMN

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

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

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

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

STEERING WHEEL

The steering wheel shall be a two (2) spoke, vinyl padded, minimum 18" diameter, with a center hub mounted horn button.

ROAD SAFETY KIT

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

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

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

CHASSIS ELECTRICAL SYSTEM

All electrical wiring in the chassis shall be GXL cross link insulated type. Wiring is to be color coded and include function codes every three (3) inches on both sides. Wiring harnesses shall be routed in protective, heat resistant loom, securely and neatly installed. Two (2) power distribution centers shall be provided in central locations for greater accessibility. The power distribution centers shall contain thermal automatic reset breakers, power control relays, flashers, diode modules, daytime driving light module, and engine and transmission data links. All breakers and relays shall have a

capacity substantially greater than the expected load on the related circuit, thus ensuring long component life. Power distribution centers shall be composed of a system of interlocking plastic modules for ease in custom construction.

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

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

WIRING HARNESS DESCRIPTION

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

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

All circuits shall conform to SAEJ1292. All circuits must be provided with low voltage over current protective devices.

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

DIRECT GROUNDING STRAPS

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

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

12 VOLT ELECTRICAL SYSTEM TESTING

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

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

TEST #1-RESERVE CAPACITY TEST

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

TEST #2-ALTERNATOR PERFORMANCE TEST AT IDLE

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

TEST #3-ALTERNATOR PERFORMANCE TEST AT FULL LOAD

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

LOW VOLTAGE ALARM TEST

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

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

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

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

ELECTRICAL MANAGEMENT SYSTEM

A Class 1 ES-Key Electrical Management System shall be utilized on the chassis for all functions applicable. The system shall consist of the following components:

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

A Universal System Manager (USM), which acts as the main controlling component of the multiplexing system shall be provided and factory programmed to DOT, NFPA, SAE, the manufacturer and Foley Fire Department specifications. The programming shall be done by the manufacturer's engineering department. The ES-Key system installation shall comply with SAE J 551 requirements regarding Electromagnetic and Radio Frequency interference (EMI, RFI), as well as utilize components and wiring practices that insure the system is protected against corrosion, excessive temperatures, water, excessive physical, and vibration damage by any equipment installed on the vehicle at the time of delivery.

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

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

A Class1 UltraView # UV450 4.3" color transmissive TFT display for monitoring critical apparatus and engine information shall be provided an installed. The displays shall be CAN based utilizing J1939 message protocol. The display shall utilize a bonded LCD display screen for optimal visibility in direct sunlight.

The display shall be fully configurable and when used in conjunction with the Class1 ES-Key system and shall be custom programmed to control multiple apparatus functions and perform onboard apparatus and engine diagnostics.

AXIS SMART TRUCK VEHICLE MONITORING SYSTEM

An Axis Smart Truck Vehicle Monitoring System shall be included as part of the vehicle.

INTERLOCK INTERFACE MODULE

A Vocation Module, which is the interface between the multiplexing system and the pump system shall be provided. This module shall serve as the interface between the operator, engine, transmission and pumping system. The module shall be installed under the driver's side dash, in a sealed enclosure that shall possess green indicating LEDs that shall indicate to service personnel the interlock state of the apparatus. In the event of a multiplexing error involving pump operation can be activated to ensure reliable pumping operations at ALL times. In addition to controlling pump function, this vocation module shall be able to provide automatic and/or manual activation of engine “Fast Idle”, to maintain adequate alternator output and thus, chassis voltage.

CHASSIS DIAGNOSTICS SYSTEM

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

The diagnostic system shall include the following:

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

VOLTAGE MONITOR SYSTEM

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

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

INDICATOR LIGHT AND ALARM PROVE-OUT SYSTEM

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

12 VOLT SEQUENCER

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

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

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

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

ELECTRICAL HARNESS REQUIREMENT

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

- SAE J 1128 - Low tension primary cable
- SAE J 1292 - Automobile, truck, truck-tractor, trailer and motor coach wiring
- SAE J 163 - Low tension wiring and cable terminals and splice clips
- SAE J 2202 - Heavy duty wiring systems for on-highway trucks
- NFPA 1901 - Standard for automotive fire apparatus
- FMVSS 302 - Flammability of interior materials for passenger cars, multipurpose passenger vehicles, trucks and buses
- SAE J 1939 - Serial communications protocol
- SAE J 2030 - Heavy-duty electrical connector performance standard
- SAE J 2223 - Connections for on board vehicle electrical wiring harnesses
- NEC - National Electrical Code
- SAE J 561 - Electrical terminals - Eyelet and spade type
- SAE J 928 - Electrical terminals - Pin and receptacle type A.

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

Wiring shall be run in loom or conduit where exposed, and have grommets or other edge protection where wires pass through metal. Wire colors shall be integral to each wire insulator and run the entire length of each wire. Harnessing containing multiple wires and uses a single wire color for all wires shall not be allowed. Function and number codes shall be continuously imprinted on all wiring harness conductors at 3.00" intervals. All wiring installed between the cab and into doors shall

be protected by a wire conduit to protect the wiring. Exterior exposed wire connectors shall be positive locking, and environmentally sealed to withstand elements such as temperature extremes, moisture and automotive fluids. Electrical wiring and equipment shall be installed utilizing the following guidelines:

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

BATTERY CABLE INSTALLATION

All 12-volt battery cables and battery cable harnessing installed by the apparatus manufacturer shall conform to the following requirements:

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

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

- Splices shall not be allowed on battery cables or battery cable harnesses.
- For ease of identification and simplified use, battery cables shall be color coded. All positive battery cables shall be marked red in color. All negative battery cables shall be black in color.
- For ease of identification, all positive battery cable isolated studs throughout the cab and chassis shall be red in color.

- For increased reliability and reduced maintenance, all electrical buss bars located on the exterior of the apparatus shall be coated to prevent corrosion.
- An operational test shall be conducted to ensure that any equipment that is permanently attached to the electrical system is properly connected and in working order.

ALTERNATOR

There shall be a Delco Remy Model 40SI, 275 amp brushless, serpentine belt driven alternator. The brushless design of the 40SI transfers magnetic fields between the rotor and stator air-gap without brushes.

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

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

BATTERY SYSTEM

Three (3) Exide #HP-31D, maintenance free batteries shall be provided. These batteries shall be wired in parallel to the master disconnect switch. Each battery shall be rated at 925 CCA at 0° F and shall have a reserve capacity of 180 minutes.

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

BATTERY STORAGE

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

The battery tray shall be able to withstand a longitudinal acceleration of -46.5g at 0.246 seconds in accordance to SAE J211 standards using a channel frequency class 600 filter. Testing shall be performed at and verified by a third party testing and evaluation center.

BATTERY DISCONNECT SWITCH

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

BATTERY JUMPER STUDS

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

120 VOLT SHORELINE CONNECTION - "SUPER" AUTO EJECT

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

The disconnect shall be equipped with a NEMA 5-20 P male receptacle, which shall automatically eject the shoreline when the vehicle starter is energized. The mating connector shall be included with the auto eject and shall be provided as loose equipment. A label shall be provided indicating voltage and amperage ratings.

SHORELINE POWER INLET PLATE

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

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

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

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

BATTERY CHARGER / AIR COMPRESSOR SYSTEM

A Kussmaul model #091-187-12-REMOTE, "Auto Charge 1200" high output, fully automatic battery charger shall be provided for maintaining the vehicle battery system. Unique electronic sensing circuits sense the true battery voltage while eliminating the need for external sense wires. Output current shall be 40 amperes @ 12 volt DC.

A Kussmaul 091-9HP air compressor shall maintain the air pressure in the chassis air brake system while the vehicle is not in use. The air compressor shall have a rated input at 120 volts AC @ 3.5 amps and a maximum of 125 psi.

A LED bar graph display shall be located near the shoreline connection to monitor the battery status.

A Kussmaul # 091-9-090 Auto Drain ACHP shall be installed to protect the Auto Pump from built up moisture.

SHORELINE POWER STRIP

A 120 volt household type power strip shall be located as directed in the rear crew area of the cab. The power strip shall be equipped with a minimum of six (6) outlets. The power strip shall be wired into the shoreline receptacle to provide a 120 volt power source for fire department equipment.

The power strip shall be mounted on the rear vertical surface of the engine enclosure.

EMERGENCY/AUXILIARY SWITCHES

The cab shall be designed with multiple areas for component switching within easy reach of the driver and or officer. This switch package shall separate the emergency / auxiliary electrical functions from the regular chassis functions. A minimum of twenty one (21) programmable CAN Bus Eaton model #E33 switches with integral indicator lights shall be provided.

Twelve (12) of switches shall be located on a sloped panel above the above the driver's position for warning lights and auxiliary controls. A master warning switch shall be provided, which shall allow pre-setting of emergency light switches and shall have a red integral indicator light.

Additional switches shall be located on the lower switch panel/s between the driver and officer for auxiliary controls.

Switch layout from left to right shall be as follows:

a. Lightbar Clear
b. Wig-wag
c. Master
d. Rear Scene
e. Brow Light
f. Driver's Side Scene
g. Officer's Side Scene
h. Ground Lights
i. Spare
j. Spare

All switches, (other than the master switch), shall have switch function labeling and an integral indicator light.

"LED" CAB INTERIOR LIGHTING

Four (4) Weldon 8080-8001-13 interior LED combination red/white dome lights shall be furnished in the cab, two (2) in the forward section and two (2) in the rear crew section. Each dome light shall have an integral selector switch. Each dome light shall also activate when the respective, adjacent cab door is opened.

"DO NOT MOVE APPARATUS" WARNING LIGHT

A 1" round, red flashing warning light with an integral audible alarm shall be functionally located in the cab to signal when an unsafe condition is present; such as an open cab or body compartment door, an extended ladder rack, a deployed stabilizer, an extended light tower or any other device that may be opened, extended or deployed and might cause damage to the apparatus if it is moved.

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

12 VOLT POWER PORT NEAR OFFICER

Two (2) 12 volt power port accessory outlet(s) shall be installed in the cab of the truck for the fire departments accessory devices. The port(s) shall be located as directed near the officer's seating position for devices such as cellular phones.

12 VOLT POWER PORTS - REAR FACING SEAT BASES

Two (2) 12 volt power port accessory outlets shall be installed in the cab of the truck for fire department accessory devices. The ports shall be located in the rear crew area, one (1) in each rear facing seat base.

12 VOLT ACCESSORY CIRCUIT- CAB DASH

One (1) dedicated circuit; 12 volt, 40 Amp, power and ground on 3/8 stud and fused at battery shall be provided in the cab dash. The circuit shall be for future installation of radios or accessories.

12 VOLT ACCESSORY CIRCUIT- BEHIND OFFICERS SEAT

One (1) dedicated circuit; 12 volt, 40 amp, power and ground on 3/8 stud and fused at battery shall be provided behind the officer seat.

An additional 12 volt, 20 amp, power stud shall be installed next to the studs above and shall be switched with the ignition circuit.

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

BLUE SEA FUSE BLOCK - 12 CIRCUIT IN REAR CREW AREA

A Blue Sea 5026B, 12 circuit fuse block, shall be installed behind the officer's seat. This block has a maximum amperage of 60 Amps per block and 30 Amps per circuit.

MULTI - USE POWER POINT IN REAR OF CAB

A Mobile Vision (Magnadyne DVU-3G2) multi-use power point with built in two (2) USB ports, and two (2) 12 volt sockets shall be installed in the rear of the cab on the back of the engine enclosure. This shall be capable of supplying the USB ports with up to three (3) amps and have a 15 amp fuse for overall protection.

IGNITION STUD - REAR CREW AREA

An ignition stud shall be installed in the rear crew area for items needing an ignition circuit (i.e. mobile radio). This stud has a maximum amperage of 20 Amps.

HEADLIGHTS CLUSTER

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

The headlight modules shall be stacked on top of each other, not offset.

DAYTIME RUNNING LIGHTS

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

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

SECONDARY DUAL LIGHT MODULE

Two (2) Whelen 6CT arrow shaped, amber LED turn signals shall be provided, one (1) in each side of the dual light module above the headlights.

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

DOT MARKER LIGHTS AND REFLECTORS

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

Optronics Model MCL48 amber LED marker lights with chrome bezel shall be provided on the side of the cab behind the front cab doors, one (1) each side.

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

Optronics Model #STL71AMB yellow LED side marker and turn lights shall be provided on the apparatus lower side, forward of rear axle, one (1) each side if the apparatus is 30' long or longer.

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

Optronics MCL12 LED 3-lamp identification bar will be provided on the apparatus rear center. The lights shall be red in color.

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

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

Truck-Lite # 98034Y yellow reflectors shall be provided on the side of the cab lower side, as far forward and low as practical, one (1) each side.

LED LICENSE PLATE LIGHT - REAR

One (1) Tecniq model #L10 LED license plate light shall be provided above the mounting position of the license plate. The light shall be clear in color and shall have a chrome finish.

TAIL, STOP, TURN AND BACK-UP LIGHTS

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

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

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

Two (2) Whelen PLASC4V mounting flanges, installed one (1) on each side, shall be provided to mount the lights described above in one common mounting flange. The fourth opening shall be for the lower rear warning lights.

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

CAB STEP LIGHTS

Polished stainless steel, TecNiq Eon 3-LED horizontal surface mounted chassis step lights shall be provided and controlled with marker light actuation. Step lights shall be located to properly illuminate all chassis access steps and walkway areas and shall include a mounting gasket to provide a watertight seal.

BODY STEP LIGHTS

Polished stainless steel, TecNiq Eon 3-LED horizontal surface mounted body step lights shall be provided and controlled with marker light actuation. Step lights shall be located to properly illuminate all body access steps and walkway areas and shall include a mounting gasket to provide a watertight seal.

DUNNAGE AREA LIGHTING

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

HOSE BED LIGHTS

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

HOSE BED WORK LIGHT - SWITCH

The hose bed work light shall have a protected 12-volt switch at the rear body panel. The switch will be labeled "HOSE BED WORK LIGHTS".

SCENE LIGHTS - BEHIND FRONT CAB DOORS

Two (2) Whelen M9LZC LED scene lights shall be provided, one on each side of the cab, directly behind the front cab entrance door in a chrome plated flange. Each light shall draw 6 amps and generate 6,500 lumens. The scene lights shall be wired through the load management system.

SCENE LIGHTS - REAR OF BODY

Two (2) Whelen M9LZC LED scene lights shall be provided, one on each side of the rear body panel in a chrome plated flange. Each light shall draw 6 amps and generate 6,500 lumens. The scene lights shall be wired through the load management system.

SCENE LIGHTS - DRIVER SIDE OF BODY

Two (2) Whelen M9LZC LED scene lights shall be provided. The scene lights shall be installed one rearward and one forward on the driver side of the body in a chrome plated flange. Each light shall draw 6 amps and generate 6,500 lumens. The scene lights shall be wired through the load management system.

SCENE LIGHTS - OFFICER SIDE OF BODY

Two (2) Whelen M9LZC LED scene lights shall be provided. The scene lights shall be installed one rearward and one forward on the officer side of the body in a chrome plated flange. Each light shall draw 6 amps and generate 6,500 lumens. The scene lights shall be wired through the load management system.

CAB DOOR LIGHT SWITCHING - CAB

Two (2) switches shall be provided in the cab warning light switch console to turn the lights at the cab doors on and off. One (1) switch shall control the driver side light and one (1) switch shall control the officer side light.

REAR OF BODY LIGHT SWITCHING - CAB

A switch shall be provided in the cab warning light switch console to turn the rear of body lights on and off.

DRIVER SIDE OF BODY LIGHT SWITCHING - CAB

A switch shall be provided in the cab warning light switch console to turn the driver side of body lights on and off.

OFFICER SIDE OF BODY LIGHT SWITCHING - CAB

A switch shall be provided in the cab warning light switch console to turn the officer side of body lights on and off.

CAB SCENE LIGHTS - ADDITIONAL ACTIVATION

In addition to the cab mounted switch for the cab scene lights, the driver and officer cab doors shall activate the respective light when a cab door is opened.

REAR SCENE LIGHTS - ADDITIONAL ACTIVATION

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

GROUND LIGHTS - CAB

One (1) ROM V4 12" LED ground light shall be provided under each side cab door entrance step, four (4) total. The lights shall be mounted in ROM standalone aluminum mounting track with mounting slots at each end. The ground lights shall turn on automatically with each respective door jamb switch and also by a master ground light switch in the warning light switch console.

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

GROUND LIGHTS - PUMP PANEL

One (1) ROM V4 12" LED ground light shall be provided under each side pump panel running board, two (2). The lights shall be mounted in ROM standalone aluminum mounting track with mounting slots at each end. The ground lights shall be activated by a master ground light switch in the cab and shall be wired through the load management system.

GROUND LIGHTS - REAR

One (1) ROM V4 12" LED ground light shall be provided under each rear body corner, two (2) total. The lights shall be mounted in ROM standalone aluminum mounting track with mounting slots at each end. The ground lights shall be activated by a master ground light switch in the cab and shall be wired through the load management system.

The lights shall be positioned to illuminate the ground under the rear tailboard. These shall be mounted at a 45 degree angle and illuminate in reverse when the primary warning lights are on.

GROUND LIGHT SWITCHING

The cab and body ground lights shall activate by engaging the parking brake.

ROOF MOUNT 150W LED BROW LIGHT - ABOVE WINDSHIELD

One (1) Whelen Pioneer Plus # PFS2 super LED roof mount flood/spot light shall be provided and installed. The mounting bracket shall attach to the lamp head and be machined to conform to the roof radius.

The lamp head shall have two (2) combination spot/flood LED modules and shall draw 12 amps and generate 16,000 lumens. The lamp head shall incorporate an adjustable downward angle to maximize the light effectiveness.

The lamp head and brackets shall be powder coated white.

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

LIGHT(S) ABOVE WINDSHIELD SWITCHING - CAB

A switch shall be provided in the cab warning light switch console to turn the light(s) above windshield on and off.

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

12 VOLT BODY ELECTRICAL SYSTEM

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

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

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

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

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

POWER DISTRIBUTION MODULES

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

The Remote Power Modules (RPM) provide a method of controlling loads on the vehicle, outside the cab, without running individual wires from each switch to the load. This electronic module distributes and controls power to various devices on the vehicle as commanded by the control system inside the cab. The RPM is connected to the Electrical System Controller via the J1939 datalink. Each module receives power from a power cable, protected by a fusible link to the main battery circuit.

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

PUMP ENCLOSURE WORK LIGHTS

Two (2) Peterson model #M391 lights shall be provided inside the pump enclosure providing a minimum of 20 candlepower illumination. Each light shall have their own independent switch incorporated into the light head.

ENGINE COMPARTMENT WORK LIGHTS

Two (2) Peterson model #M391 lights shall be provided inside the engine enclosure that will provide a minimum of 20 candlepower illumination. Each light shall have their own independent switch incorporated into the light head.

COMPARTMENT LIGHT ACTIVATION

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

ROM TRACK MOUNTED COMPARTMENT LIGHTS - LED

Each individual, equipment storage compartment shall be equipped with the ROM LED V4 lights on the forward and rear edge of each body door opening. The lights shall be mounted in an anodized aluminum track provided by ROM either as a standalone unit or an integrated part of the roll up shutter door track. The lights shall be designed and manufactured to be water proof meeting the IPX7 industry standard and shall include a streamline optic lens and a fixed lumen output across 9-16vdc. Each LED module shall be of interlocking design and shall be able to be serviced/replaced without the removal of light assembly or shutter door.

COMPARTMENT LIGHTS - LED

Each walkway compartment shall have one (1) Tecniq LED model #E18 white dome light. Each light shall come on automatically when the respective door is opened and the master battery switch is on.

COMMAND LIGHT, KNIGHT-2 MODEL KL415D-W2 LED LIGHT TOWER

The apparatus shall be equipped with an all-electric floodlight tower.

The light tower shall extend 87-1/2" above the mounting surface and shall extend to full upright position in less than 15 seconds. The light tower shall weigh approximately 165 pounds.

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.

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 lower stage 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.

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:

- Two (2) switches, one (1) for each light bank.
- One (1) light bank rotation switch.
- One (1) switch for elevating lower and 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.

The Command Light shall be equipped with the following bank of floodlights:

- Floodlight manufacturer: Whelen Engineering
- Number of lamp heads: Four (4) Pioneer Plus LED
- Voltage: 12 volt
- Watts of each lamp head: 175 watts
- Total watts of light tower: 700 watts
- Amperage per lamp head: 13 amps
- Total amperage of light tower: 52 amps
- Total Lumens of light tower: 64,000 lumens

The light heads shall be mounted two (2) on each side of the light tower, giving two (2) vertical lines of two (2) when the lights are in the upright position.

The light tower controller shall be mounted on the front wall of compartment L1.

COMMAND LIGHT - BACK LIGHTING

The specified Command Light, light tower shall be equipped with the back light option. This shall allow the bottom bank of lights to be rotated independently of the other light banks.

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

NFPA AUDIBLE AND LIGHTING WARNING PACKAGE

The following warning light package shall include all of the minimum warning light and actuation requirements for the current revision of the NFPA 1901 Fire Apparatus Standard. The lighting as specified shall meet the requirements for both "Clearing Right of Way" and "Blocking Right of Way" which includes disabling all white warning lights when the apparatus is in "Blocking Right of Way" mode.

LIGHT PACKAGE ACTUATION CONTROLS

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

WARNING LIGHT FLASH PATTERN

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

UPPER LEVEL LIGHTING - WHELEN

NFPA ZONE A, UPPER

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

The light bar shall be equipped with the following:

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

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

The Freedom light bar shall be equipped with one (1) pair(s) of # F4DLR red LED warning lights.

NFPA ZONE C, UPPER

Two (2) Whelen C9LR w/C9FC LED light heads shall be furnished and mounted one (1) each side on the upper rear face of the body, facing rear.

Each light head shall be equipped with red LEDs and a colored lens.

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

NFPA ZONES B & D REAR, UPPER

Two (2) Whelen C9LR w/C9FC LED light heads shall be furnished and mounted one (1) each side on the upper side face, towards the rear of the body, facing to each side of the unit.

Each light head shall be equipped with red LEDs and a colored lens.

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

NFPA ZONES B & D FRONT, UPPER

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

LOWER LEVEL LIGHTING - WHELEN

NFPA ZONE A, LOWER

Two (2) Whelen C6LR LED light heads shall be provided and installed one (1) each side.

Each light head shall be equipped with red LEDs and a colored lens.

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

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

NFPA ZONE C, LOWER

Two (2) Whelen C6LR w//C6FC LED light heads shall be provided and installed one (1) each side directly below the DOT stop, tail, turn and backup lights.

Each light head shall be equipped with red LEDs and a colored lens.

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

NFPA ZONES B & D FRONT, LOWER

Two (2) Whelen C6LR w//C6FC LED light heads shall be provided and installed one (1) each side.

Each light head shall be equipped with red LEDs and a colored lens.

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

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

NFPA ZONES B & D MIDSHIP, LOWER

Two (2) Whelen C6LR w//C6FC LED light heads shall be provided and installed one (1) each side.

Each light head shall be equipped with red LEDs and a colored lens.

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

NFPA ZONES B & D REAR, LOWER

Two (2) Whelen C6LR w//C6FC LED light heads shall be provided and installed one (1) each side.

Each light head shall be equipped with red LEDs and a colored lens.

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

WARNING LIGHT SYSTEM CERTIFICATION

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

The warning light system(s) shall be certified by the light system manufacturer(s), to meet all of the requirements in the current revision of the NFPA 1901 Fire Apparatus Standard as noted in the

General Requirements section of these specifications. The NFPA required "Certificate of Compliance" shall be provided with the completed apparatus.

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

ALTERNATING FLASHING HEADLIGHT SYSTEM

An alternating flashing wig-wag system, wired to the apparatus headlights, shall be installed. The wig-wag system shall be individually switched at the master light console. The alternating flashing system shall be automatically disabled during the "Blocking Right of Way" mode.

AUXILIARY WARNING LIGHTS

Two (2) surface mounted C6LR w//C6FC LED light heads shall be furnished and mounted one (1) on each side of the cab above the air intakes.

Each light head shall be equipped with red LEDs and a colored lens.

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

The lights specified above shall be provided in addition to the NFPA required Optical Warning Light Package and shall be activated by the master emergency warning light control. Wiring for these lights shall be run through the Load Management System to ensure that the electrical system is not overloaded by the additional amperage draw requirements.

TRAFFIC ADVISER WARNING LIGHT

One (1) Whelen LED "Traffic Advisor", model TAL65 36", rear directional light shall be installed on the rear of the body. The light shall be equipped with six (6) lamps. The directional light shall be activated by a control module. The control module shall be conveniently located near the driver's position. The rear directional light shall be wired through the load management system of the unit.

TRAFFIC ADVISOR - MOUNTING ON THE REAR SHEET

The traffic advisor shall be mounted on the rear sheet.

******* AUDIBLE WARNING EQUIPMENT *******

ELECTRIC HORN

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

BACK-UP ALARM

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

AIR HORNS

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

Both air horns shall be recessed in the front bumper.

The air horn(s) shall be controlled by a push button located on the dash, on the officer's side and the steering horn button for the driver. An air horn/ electric DOT horn selector switch shall be furnished on the dash for the drivers steering horn button.

ELECTRONIC SIREN AND SPEAKER

One (1) Whelen # 295HFS2, 100 watt electronic siren shall be provided featuring: flush mount remote control head recessed in center dash panel as space allows, "Si-Test" self-diagnostic feature, six (6) function siren, radio repeat and public address.

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

The siren shall be mounted in the center of the center dash.

A switch shall be provided on the officer's side of the dash next to the air horn switch and the driver's side of the dash next to the air/elec. switch for the Hands Free feature of the Whelen siren. The switches must fully perform the HF feature as provided by Whelen.

One (1) Whelen, model # SP123BMC with chrome plated ABS outer flange, siren speakers shall be provided, recessed in the front bumper and wired to the electronic siren.

FEDERAL Q2B MECHANICAL SIREN

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

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

One (1) floor mounted foot switch shall be provided for the driver, and one (1) dash mounted intermittent rocker switch for the officer. A siren brake button shall be provided near the driver's position.

A second push button siren brake switch shall be provided on the cab dash near the officers seating position. The siren brake shall be above the power ports on the officer's side dash panel.

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

PUMP

- **WATEROUS CSU-C20**
- **1500 G.P.M.**
- **SINGLE-STAGE**

The pump shall be of single-stage construction and shall comply with all applicable requirements of the latest standards for automotive fire apparatus of the National Fire Protection Association, NFPA-1901 and shall have a rated capacity of 1500 gpm.

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

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

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

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

PUMP CONSTRUCTION

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

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

IMPELLER SHAFT

The Impeller shaft shall be heat-treated stainless steel, ground at all critical areas, and polished under the packing. An exclusive two-piece impeller shaft shall allow separation of the transmission from the pump without disassembling either component. This simplifies repair procedures, resulting in less down time.

PUMP IMPELLER

The impeller shall be bronze, accurately balanced (mechanically and hydraulically), of mixed flow design with reverse flow labyrinth-type wear rings that resist water bypass and loss of efficiency due to wear. The impeller shall have flame plated hubs to assure maximum pump life and efficiency despite the presence of abrasive particles, such as fine sand, in the water being pumped.

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

BEARINGS

Three deep-groove, anti-friction ball bearings shall be located outside the pumping chamber, which shall give support and proper alignment to the impeller shaft assembly. The bearings shall be oil or grease lubricated, completely separated from the water being pumped, and shall be protected by seal housings, finger rings and oil seals.

PUMP PACKING

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

PUMP TRANSMISSION

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

PUMP RATIO

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

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

PUMP SHIFT

The pump shift shall be pneumatically operated and shall incorporate a standard automotive air valve shifting mechanism for ease of maintenance and parts availability.

The pump shift shall be mounted in the cab and identified as PUMP SHIFT, and include shift instructions permanently inscribed on the pump shift switch plate. The in cab control shall include a detent lock to prevent accidental shifting.

EMERGENCY PUMP SHIFT

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

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

PUMP SHIFT INDICATORS LIGHT

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

TRANSMISSION LOCK

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

BRAKING SYSTEM

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

MAIN PUMP MOUNTS

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

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

FIRE RESEARCH "IN-CONTROL" PRESSURE GOVERNOR

The apparatus shall be equipped with a Fire Research InControl series TGA300 pressure governor and monitoring display kit shall be 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. Inputs for monitored information shall be from a J1939 databus or independent sensors. Outputs for engine control shall be on the J1939 databus or engine specific wiring.

The 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. It shall monitor inputs and support audible and visual warning alarms for the following conditions:

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

The program features shall be accessed via push buttons located on the front of the control panel. There shall be an 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.

ELKHART INTAKE RELIEF VALVE

An Elkhart Model 40 intake relief valve system shall be plumbed on the suction side of the pump to comply fully with NFPA-1901 requirements. It shall have an adjustable pressure relief setting from 75 psi to 250 psi and is factory preset at 125 psi. Excess pressures shall be plumbed to discharge water under the pump enclosure away from the pump operator.

PUMP CERTIFICATION

The pump shall be third party performance tested to meet the requirements of NFPA-1901. To ensure top quality and integrity, the test company shall be Underwriters Laboratories (UL).

PUMP PRIMER

The priming pump will be a Trident air primer system. A push in primer handle will open the priming valve and prime the pump.

The priming system shall be capable of priming at up to four (4) locations.

REMOTE PRIMING VALVE

Additional primer control valve(s) shall be furnished to prime up to four (4) locations, to be determined at pre-construction. The Trident Emergency products RPV (remote priming valve) shall activate using the same air that powers the AirPrime™ system when the coinciding panel valve is depressed.

MASTER DRAIN VALVE

A rotary type, 12 port master drain valve shall be provided and controlled at the lower portion of the side pump panel. The valve shall be located in pump compartment lower than the main body and connected in such a manner as to allow complete water drainage of the pump body and all required accessories. Water shall be drained below the apparatus body and away from the pump operator.

MASTER DRAIN

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

INDIVIDUAL BLEEDERS AND DRAINS

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

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

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

All drains and bleeders shall discharge below the running boards.

SYNFLEX SUCTION, DISCHARGE, PRESSURE AND CONTROL LINES

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

ANODE BLOCKS

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

The Anodes shall be painted Safety Yellow for identification purposes.

TOP MOUNT PUMP MODULE

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

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

TOP MOUNTED VALVE CONTROLS

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

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

DUNNAGE AREA

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

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

TRANSVERSE WALKWAY

There shall be a transverse walkway located at the rear of the chassis cab, ahead of the pump module. The walkway shall be constructed of 3/16" aluminum tread plate and shall be clear and unobstructed for through traffic. Folding step(s) shall be provided if necessary to maintain NFPA step heights. If steps adjacent to walkway (such as commercial chassis cab access steps) provide NFPA compliant step height, folding steps shall not be provided.

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

A fold down step shall be provided in the center of the walkway to assist with deck gun operation.

The pump house walkway shall be approximately 18" wide.

FOLD STEPS REAR CAB WALL

A folding step shall be provided on the exterior rear wall of the cab, on the driver and officer side, to provide easy access to the pump house walkway. The steps shall mount approximately 13" from the bottom of the rear cab sheet and centered 6" from the outer edge of the cab. The step shall match the folding steps utilized on the apparatus body.

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

SUCTION INLETS

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

PUMP SUCTION ENDS

The main pump suction inlets shall be furnished with a suction end terminating with the **rear most suction threads protruding through the side panel 1.5" beyond the pump panel.**

A 6" NST chrome plated long handle pressure vented cap shall be installed on each main inlet of the pump.

AUXILIARY SIDE SUCTION(S)

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

An Akron Brass 2 1/2" Generation II Swing-Out™ Valve shall be provided for the driver's side rear auxiliary suction. The valve shall have an all brass body with flow optimizing stainless steel ball and dual polymer seats.

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

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

An Akron Brass 2 1/2" Generation II Swing-Out™ Valve shall be provided for the officer's side rear auxiliary suction. The valve shall have an all brass body with flow optimizing stainless steel ball and dual polymer seats.

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

All side gated inlet valves shall be recess mounted behind the side pump panels or body panels.

TANK TO PUMP

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

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

An Akron Brass 3" Generation II Swing-Out™ Valve shall be provided between the pump suction manifold and the water tank. The valve shall have an all brass body with flow optimizing stainless steel ball and dual polymer seats.

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

TANK FILL

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

An Akron Brass 2" Generation II Swing-Out™ Valve shall be provided between the pump discharge manifold and the water tank. The valve shall have an all brass body with flow optimizing stainless steel ball and dual polymer seats.

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

******* DISCHARGES & ACCESSORIES - TOP MOUNT *******

DRIVER'S SIDE MAIN DISCHARGE #1

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

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

An Akron Brass 2 1/2" Generation II Swing-Out™ Valve shall be provided for the driver's side #1 discharge. The valve shall have an all brass body with flow optimizing stainless steel ball and dual polymer seats.

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

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

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

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

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

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

DRIVER'S SIDE MAIN DISCHARGE #2

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

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

An Akron Brass 2 1/2" Generation II Swing-Out™ Valve shall be provided for the driver's side #2 discharge. The valve shall have an all brass body with flow optimizing stainless steel ball and dual polymer seats.

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

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

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

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

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

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

OFFICER'S SIDE MAIN DISCHARGE #1

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

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

An Akron Brass 2 1/2" Generation II Swing-Out™ Valve shall be provided for the officer's side #1 discharge. The valve shall have an all brass body with flow optimizing stainless steel ball and dual polymer seats.

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

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

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

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

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

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

OFFICER'S SIDE MAIN DISCHARGE #2

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

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

An Akron Brass 4" Heavy Duty Swing-Out™ Valve shall be provided for the officer's side #2 discharge. The valve shall have an all brass body with flow optimizing flat ball and dual polymer seats.

The discharge valve shall be equipped with a straight 4" NST adapter that shall be equipped with a 4" NST, 30-degree, chrome plated elbow.

The officer's side #2 discharge cap provided as standard equipment shall be deleted.

A 4" NSTF X 5" Storz Kochek S37S straight adapter with cap shall be provided on the officer's side #2 discharge.

The officer's side #2 discharge Akron ball valve shall be equipped with an Akron Brass Style 9323 Valve Controller. The electric controls shall be of true position feedback design, requiring no clutches in the motor or current limiting. The unit shall be completely sealed with momentary open, close as well as an optional one touch full open feature to operate the actuator. Two additional buttons shall be available to be used for preset selection, preset activation and menu navigation. The controller shall have up to three preset locations that can be user set and easily recalled upon each use. The unit shall be capable of being used in conjunction with at least two additional displays to control one valve. The unit shall provide position indication through a full color backlit LCD display.

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

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

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

TOP MOUNT DISCHARGE CONTROLS

All top mount valves shall be controlled by a locking push/pull swing handle unless otherwise noted in the individual discharge below.

DRIVER SIDE REAR DISCHARGE

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

The rear discharge shall be plumbed through a notch in the water tank that shall terminate on the rear body panel, on the driver side of the body.

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

The driver side rear discharge shall be plumbed utilizing 2 1/2" schedule 10 stainless steel piping, 45 degree elbows and a limited number of 90 degree sweep elbows in an assembly from the pump to the rear of the vehicle.

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

An Akron Brass 2 1/2" Generation II Swing-Out™ Valve shall be provided for the driver's side rear discharge. The valve shall have an all brass body with flow optimizing stainless steel ball and dual polymer seats.

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

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

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

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

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

DECK GUN DISCHARGE

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

The deck gun discharge shall be located in the center of the TOP MOUNT PANEL area above the pump module, centered on the pump operator's panel. The piping shall be positioned so the deck gun appliance is accessible from the pump operator's position.

A pedestal type, 1/4" steel plate support assembly or "U" clamp shall be provided to stabilize deck gun plumbing below deck gun mount flange.

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

To improve the operation range of the deck gun, the discharge pipe shall be outfitted with a TFT (18") Extend-A-Gun, part # XG18VL-PL. The Extend-A-Gun shall be wired to the hazard light on the cab dash.

WARNING LIGHT - IN CAB - "DECK GUN RAISED"

A hazard warning light shall be installed to alert the driver, "Deck Gun Raised".

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

The deck gun discharge shall be plumbed utilizing 3" schedule 10 stainless steel piping, 45 degree elbows and a limited number of 90 degree sweep elbows in an assembly from the pump to the deck gun location.

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

An Akron Brass 3" Generation II Swing-Out™ Valve shall be provided for the deck gun discharge. The valve shall have an all brass body with flow optimizing stainless steel ball and dual polymer seats.

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

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

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

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

FRONT DISCHARGE

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

The front #1 discharge shall terminate on the top driver's side of the front bumper extension gravel shield with a chrome 2 1/2" NST chicksan swivel adapter.

A swivel stop post covered with black heat shrink shall be installed to prevent the hose line from damaging the Q2B siren.

The front #1 discharge shall be plumbed utilizing 2 1/2" schedule 10 stainless steel piping and/or flexible hose, 45 degree elbows and a limited number of 90 degree sweep elbows in an assembly from the pump to the front of the vehicle.

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

An Akron Brass 2 1/2" Generation II Swing-Out™ Valve shall be provided for the front #1 discharge. The valve shall have an all brass body with flow optimizing stainless steel ball and dual polymer seat.

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

The front #1 discharge cap provided as standard equipment shall be deleted.

A 2-1/2" NSTF X 1-1/2" NSTM reducer shall be provided on the front #1 discharge.

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

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

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

HORIZONTAL SPEEDLAY #1

Speedlay #1 shall be a transverse hose bed, which shall be designed as an integral part of the pump module design. Hose deployment shall be accomplished from either side of the apparatus. The speedlay hose bed flooring shall be designed to be removable, constructed from brushed finish, perforated aluminum material.

SPEEDLAY #1 SLIDE-OUT TRAY

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

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

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

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

Speedlay #1 shall be designed to have a minimum total capacity of 3.5 cubic feet as required by NFPA -1901 to accommodate a minimum of 200 feet of 1-3/4" fire hose. The hose shall be loaded in a triple stack configuration.

The speedlay #1 discharge shall be plumbed utilizing 2" schedule 10 stainless steel piping and/or flexible hose, 45 degree elbows and a limited number of 90 degree sweep elbows in an assembly from the pump to speedlay hosebed.

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

An Akron Brass 2" Generation II Swing-Out™ Valve shall be provided for the speedlay #1 discharge. The valve shall have an all brass body with flow optimizing stainless steel ball and dual polymer seats.

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

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

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

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

HORIZONTAL SPEEDLAY #2

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

SPEEDLAY #2 SLIDE-OUT TRAY

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

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

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

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

Speedlay #2 shall be designed to have a minimum total capacity of 3.5 cubic feet as required by NFPA -1901 to accommodate a minimum of 200 feet of 1-3/4" fire hose. The hose shall be loaded in a triple stack configuration.

The speedlay #2 discharge shall be plumbed utilizing 2" schedule 10 stainless steel piping and/or flexible hose, 45 degree elbows and a limited number of 90 degree sweep elbows in an assembly from the pump to speedlay hosebed.

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

An Akron Brass 2" Generation II Swing-Out™ Valve shall be provided for the speedlay #2 discharge. The valve shall have an all brass body with flow optimizing stainless steel ball and dual polymer seats.

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

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

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

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

SPEED LAY HOSEBED HOSE RETENTION

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

The speed lay end flap shall be red in color.

BOOSTER REEL #1 DISCHARGE

A 1 1/2" booster reel discharge shall be plumbed from the pump to the booster reel.

The booster reel discharge shall be plumbed from the valve to the hose reel utilizing 1" high pressure hose. The end of the hose connected to the hose reel shall be equipped with a swivel end for ease in hose replacement.

A 1 1/2" Akron, #8800 series, full flow, stainless steel ball valve shall be provided for the booster reel #1 discharge.

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

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

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

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

BOOSTER REEL #1

One (1) painted steel electric rewind booster reel shall be furnished. The reel shall be equipped with a one (1) inch 90° full flow swivel joint and an adjustable brake for freewheeling, drag or full lock operation. Color shall be graphite.

The booster reel #1 shall be mounted above the pump enclosure towards the driver's side of the unit.

Booster reel rewind shall be controlled by a pump panel mounted push button on the driver's side panel. The booster reel circuit shall be equipped with a shielded toggle switch to act as a booster reel disconnect to avoid accidental actuation of the booster reel rewind button.

Each booster reel shall be designed to accommodate 200' of 1" booster hose.

Two (2) horizontal hose rollers of polished stainless steel and guide spools shall be placed one (1) on each side panel.

FOAM PIPING - 1 INCH

All foam concentrate plumbing from the tank or auxiliary foam inlet to the foam system components shall be PVC.

The foam system piping shall incorporate a check valve to prevent water from entering the foam tank; the discharge piping shall also include a check valve to prevent foam solution from back feeding into the discharge side of the pump. Individual discharge piping shall be as specified for each discharge.

The complete foam system shall be tested in accordance with NFPA-1901.

FOAMPRO FOAM INJECTION SYSTEM

A FoamPro model 1600, electronic, fully automatic, variable speed, direct injection, discharge side foam proportioning system shall be installed in the pumping system.

The system shall be capable of handling Class "A" foam concentrate. The foam proportioning operation shall be based on direct measurement of water flows, and remain consistent within the specified flows and pressures. System shall be capable of delivering accuracy to within 3% of calibrated settings over the advertised operation range when installed according to factory standards. The system shall be equipped with a control module suitable for installation on the pump panel. Incorporated within the motor driver shall be a microprocessor that receives input from the system flow meter, while also monitoring foam concentrate pump output, comparing values to ensure that the operator preset proportional amount of foam concentrate is injected into the discharge side of the fire pump. A paddlewheel-type flow meter shall be installed in the discharge or manifold system specified to be “foam capable”.

A 12 or 24-volt electric motor driven positive displacement plunger pump shall be provided. The pump capacity shall be 1.7 GPM (6.4 L/min) at 200 psi (13.8 BAR) with a maximum operating pressure up to 400 psi (27.6 BAR). The system shall draw a maximum of 30 amps @ 12 VDC or 15 amps @ 24 VDC. The motor shall be controlled by the microprocessor (mounted to the base of the pump). It shall receive signals from the control module and power the 1/3 hp (.25 Kw) electric motor in a variable speed duty cycle to ensure that the correct proportion of concentrate is injected into the water stream. A full flow check valve shall be provided in the discharge piping to prevent foam contamination of fire pump and water tank. A 5-psi (.35 BAR) opening pressure check valve shall be provided in concentrate line.

The control module shall enable the pump operator to:

- Activate the foam proportioning system
- Select proportioning rates from 0.1% to 1.0%
- See a “low concentrate” warning light flash when the foam tank runs low and in two minutes, if foam concentrate is not added to the tank, shut the foam concentrate pump down

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

- Operator control module
- Paddlewheel flow meter
- Pump and electric motor/motor driver
- Wiring harnesses

- Low-level tank switch
- Foam injection check valve
- Main waterway check valve

Accurate concentration proportioning can be achieved, based on the following water flows:

- 170 GPM water 1.0% concentration, class A
- 340 GPM water 0.5% concentration, class A
- 850 GPM water 0.2% concentration, class A

Note: Multiple discharges plumbed to this system may affect performance if the flow rates are exceeded by any one discharge or the totality of multiple discharges at one time!

The discharge piping shall be equipped with a properly sized flow meter sensor, based on the systems capabilities.

The foam system shall be plumbed to the following discharge/s through the discharge piping or manifold system:

- Front discharge.

The foam proportioning system shall be supplied from the foam concentrate storage tank/s. The tank/s shall be constructed of materials compatible with foam concentrates being used in the system. Tank capacity, venting, fill opening and foam outlet plumbing connections shall be in accordance with NFPA requirements. Foam tank lid shall be sealed and latched in accordance with NFPA standards. If required a provision shall be made for installation of low tank level sensors and routing of the wiring for the sensors.

FOAM CONCENTRATE

The foam system shall be capable of injecting the following foam concentrates:

- Class A - OTHER - FireAid 2000

- **No Class B foam selected or Class B foam system present.**

****** PUMP PANEL & ACCESSORIES *******

PUMP PANEL - TOP MOUNT

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

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

TOP MOUNT GAUGE PANEL

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

SIDE PUMP PANEL MATERIAL

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

HINGED GAUGE PANEL

An angled full width, horizontally hinged gauge access panel shall be provided at the top mount operator's position. Chrome plated positive locks shall be provided along with chain holders to secure the panel in the opened position.

VERTICALLY HINGED, SPLIT PUMP PANEL DRIVER SIDE

The driver side pump panel shall be split, vertically hinged, to provide complete access to the pump and plumbing on the driver side of the pump enclosure. The panels shall be equipped with stainless steel hinges and secured with push type locks to hold the panels closed. The drains located on the driver side panel shall be fastened to the lower panel, which shall be stationary.

VERTICALLY HINGED, SPLIT PUMP PANEL OFFICER SIDE

The officer's side pump panel shall be split, vertically hinged, to provide complete access to the pump and plumbing on the officer side of the pump enclosure. The panels shall be equipped with stainless steel hinges and secured with push type locks to hold the panels closed. The drains located on the officer's side panel shall be fastened to the lower panel, which shall be stationary.

PANEL FASTENERS

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

CAPS AND ADAPTERS SAFETY TETHER

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

PUMP PANEL TRIM PLATES

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

DISCHARGE GAUGE TRIM BEZELS

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

COLOR CODED IDENTIFICATION TAGS

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

PUMP OPERATOR'S PANEL LIGHT SHIELD

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

The light shield shall be equipped with the following lights:

- Three (3) 20" Amdor Luma Bar H2O super bright led strip lights.

One (1) light under the operator's panel light shield shall be actuated when fire pump is engaged in addition to the pump engaged light.

TOP MOUNT WALKWAY LIGHTING

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

- Four (4) TecNiq Eon, 3-LED illumination lights mounted in horizontal stainless steel bezels and mounting gaskets.

The lights shall be controlled with the marker lights.

DRIVER SIDE PUMP PANEL

The driver side pump panel shall be equipped with a light shield/step that shall be from the speedlays back of the control panel, and shall be positioned to cover the lights and prevent glare. The light shield shall be fabricated from aluminum tread plate, which shall also serve as a step. The step shall be a minimum of 8" deep X the width of the pump panel.

The light shield shall be equipped with the following lights:

- One (1) 20" Amdor Luma Bar H2O super bright led strip light.

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

OFFICER SIDE PUMP PANEL

The officer side pump panel shall be equipped with a light shield/step that shall be from the speedlays rearward of the control panel, and shall be positioned to cover the lights and prevent glare. The light shield shall be fabricated from aluminum tread plate, which shall also serve as a step. The step shall be a minimum of 8" deep X the width of the pump panel.

The light shield shall be equipped with the following lights:

- One (1) 20" Amdor Luma Bar H2O super bright led strip light.

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

PUMP OPERATOR'S PANEL

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

- Hinged gauge panel
- Water tank fill valve
- Auxiliary suction valve control
- All discharge valve controls
- Auxiliary engine cooler controls
- Water tank suction control valve
- Pump primer valve
- Engine throttle control
- Master compound vacuum gauge
- Master pressure gauge

- Individual discharge gauges
- Pump shift engaged indicator light
- Water tank water level indicator
- Engine tachometer
- Engine oil pressure gauge with audible alarm
- Engine water temperature gauge with audible alarm
- Low voltage light and audible alarm
- Pump panel light switch
- Speed counter (Underwriters)
- Pump performance plate (Underwriters)
- Pump serial No. plate
- Master pump drain valve
- Individual drains
- Voltmeter
- Air inlet/outlet at lower driver side panel
- Pump panel air horn actuation button labeled "EVACUATION" in white letters with a red background.
- Fire Research #TGA300 "IN CONTROL" pressure governor control.

PUMP TEST PORTS

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

MASTER GAUGES

One (1) 4" diameter pressure gauge (labeled: "PRESSURE") and one (1) 4" diameter compound vacuum gauge (labeled: "INTAKE") shall be provided. The master gauges shall be Innovative Controls glycerin filled. The gauge faces shall be white with black numerals.

PRESSURE & COMPOUND GAUGE RANGES

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

ENGINE COOLER

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

TANK LEVEL GAUGE

A Fire Research, model #WLA300-A00, "TANKVISION" gauge that shows the actual volume of water in the tank shall be provided on the pump operator's panel. The "TANKVISION" gauge is designed for both ease of operation and installation. The "TANKVISION" gauge utilizes ultra-bright multi-color LEDs for sunlight readability and also uses 2 specially designed wide-viewing lenses for 180° of clear viewing. The "TANKVISION" gauge utilizes a pressure sender to measure the liquid volume. The gauge shall be equipped with a self-calibration feature that allows the LEDs TANKVISION gauge to be used on tanks of different shapes and sizes.

Features:

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

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

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

LARGE LIGHT WATER LEVEL GAUGE, EACH SIDE OF CAB

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

The strip light shall indicate the following water levels:

- Green LED cluster — Full tank
- Blue LED cluster — 3/4 tank
- Amber LED cluster — 1/2 tank
- Red LED cluster — 1/4 tank

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

FOAM TANK LEVEL GAUGE - FOAM TANK "A"

A Fire Research, model #WLA360-A00, "TANKVISION" gauge that shows the actual volume of foam in the tank shall be provided on the pump operator's panel. The "TANKVISION" gauge is designed for both ease of operation and installation. The "TANKVISION" gauge utilizes ultra-bright multi-color LEDs for sunlight readability and also uses 2 specially designed wide-viewing lenses for 180° of clear viewing. The "TANKVISION" gauge utilizes a pressure sender to measure the liquid volume. The gauge shall be equipped self-calibration feature allows the TANKVISION gauge to be used on tanks of different shapes and sizes.

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

WATER TANK

The water tank shall have a capacity of 750 gallons, constructed from Poly material. The tank shall be notched for the driver's side rear discharge.

FOAM TANK "A"

In addition to the water capacity of the tank, a 20 gallon integral foam storage area shall be built into the water tank. The foam tank shall have a latched fill tower, properly labeled as the foam fill point. A valved drain shall be provided.

WATER TANK CONSTRUCTION

The Poly water tank shall be constructed of PT3 polypropylene material. This material shall be a non-corrosive stress relieved thermoplastic and UV stabilized for maximum protection. Tank shell thickness may vary depending on the application and may range from 1/2 to 1" as required. Internal baffles are generally 3/8" in thickness.

The tank shall be of a specific configuration and is so designed to be completely independent of the body and compartments. Joints and seams shall be fused using nitrogen gas as required and tested for maximum strength and integrity. The tank construction shall include PolyProSeal technology wherein a sealant shall be installed between the plastic components prior to being fusion welded. This sealing method will provide a liquid barrier offering leak protection in the event of a weld compromise. The top of the booster tank is fitted with removable lifting assembly designed to facilitate tank removal. The transverse and longitudinal swash partitions shall be manufactured of a minimum of 3/8" PT3 polypropylene. All partitions shall be equipped with vent and air holes to permit movement of air and water between compartments. The partitions shall be designed to provide maximum water flow. All swash partitions interlock with one another and are completely fused to each other as well as to the walls of the tank. All partitions and spacing shall comply with NFPA 1901. The walls shall be welded to the floor of the tank providing maximum strength as part of the tank's unique Full Floor Design. Tolerances in design allow for a maximum variation of 1/8" on all dimensions.

WATER CAPACITY CERTIFICATION

All tanks shall be tested and certified as to capacity on a calibrated and certified tilting scale. Each tank shall be weighed empty and full to provide precise fluid capacity. Each Poly-Tank's III is delivered with a Certificate of Capacity delineating the weight empty and full and the resultant capacity based on weight.

WATER TANKNOLOGY TAG

A tag shall be installed on the apparatus in a convenient location and contain pertinent information including a QR code readable by commercially available smart phones. The information contained on the tag shall include the capacity of the water and foam (s), the maximum fill and pressure rates, the serial number of the tank, the date of manufacture, the tank manufacturer, and contact information. The QR code will allow the user to connect with the tank manufacturer for additional information and assistance.

WATER TANK ISO CERTIFICATION

The tank must be designed and fabricated by a tank manufacturer that is ISO 9001:2000 certified in each of its locations. The ISO certification must be to the current standard in effect at the time of the design and fabrication of the tank.

WATER TANK LID

The tank cover shall be constructed of 1/2" thick PT3 polypropylene and UV stabilized, to incorporate a multi-piece locking design, which allows for individual removal and inspection if necessary. The tank cover(s) shall be flush or recessed 3/8" from the top of the tank and shall be fused to the tank walls and longitudinal partitions for maximum integrity. Each one of the covers shall have hold downs consisting of 2" minimum polypropylene dowels spaced a maximum of 40" apart. These dowels shall extend through the covers and will assist in keeping the covers rigid under fast filling conditions. A minimum of two lifting dowers shall accommodate the necessary lifting hardware.

WATER TANK FILL TOWER

The tank shall have a combination vent and 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 fill tower shall be blue in color indicating that it is a water-only fill tower. The tower shall be located in the left front corner of the tank unless otherwise specified by the tank manufacturer to the purchaser. The tower shall have a 1/4" thick removable polypropylene screen and a PT3 polypropylene hinged cover. The capacity of the tank shall be engraved on the top of the fill tower lid. Inside the fill tower there shall be a combination vent/overflow pipe. The vent overflow shall be a minimum of schedule 40 polypropylene pipe with a minimum I.D. of that is designed to run through the tank, and shall be piped to discharge water behind the rear wheels as required in NFPA 1901 so as to not interfere with rear tire traction.

WATER TANK OVERFLOW AND VENT PIPE

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

WATER TANK SUMP

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

WATER TANK 3" SUMP DRAIN

A 3" drain plug shall be provided.

WATER TANK FLANGES/OUTLETS - PUMPER

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

WATER TANK MOUNTING ALL "T" TANKS - PUMPER

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

APPARATUS BODY DESIGN CONSTRUCTION

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

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

The body shall be completely isolated from the cab and pump module structure.

BODY AND COMPARTMENT FABRICATION - 3/16" ALUMINUM

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

SUPER STRUCTURE - ALUMINUM

The body super structure shall be an all welded configuration utilizing a combination of 3” x 1-1/2” 6061-T6 thick walled structural tubing and 6061 structural channel.

This structure shall be designed to totally support the full length and width of the body and shall be welded to the body side compartments by use of reinforcement plates to incorporate the compartments into an integral part of the body weldment.

The super structure shall be bolted to the sides of the chassis frame at four (4) points.

STEPPING, STANDING, & WALKING SURFACES

All stepping, standing, and walking surfaces on the body shall meet NFPA #1901 anti-slip standards. Aluminum tread plate utilized for stepping, standing, and walking surfaces shall be ALCOA No Slip type. Upon request by the Purchaser, the manufacturer shall supply proof of compliance with this requirement.

DRIVER'S SIDE COMPARTMENTATION

One (1) full height/full depth compartment, with a roll up door, shall be provided forward of the rear wheels. Compartment dimensions 68" high x 49" wide x 29" deep, with a door opening of 64" high x 46" wide.

One (1) high side compartment, with a roll up door, shall be provided above the rear wheels. Compartment dimensions 36-1/2" high x 64" wide by 29" deep, with a door opening of 33-1/2" high by 58" wide.

One (1) full height/full depth compartment, with a roll up door, shall be provided behind the rear wheels. Compartment dimensions 68" high x 46" wide x 29" deep, with a door opening of 64" high x 46" wide.

There shall be approximately 147 cu. ft. of storage space in the driver's side compartmentation.

OFFICER'S SIDE COMPARTMENTATION

One (1) full height/split depth compartment, with a roll up door, shall be provided forward of the rear wheels. Compartment dimensions 68" high x 49" wide x 29" deep in the lower 30" high area, 14" deep in the upper 38" high area, with a door opening of 64" high x 46" wide.

One (1) high side compartment, with a roll up door, shall be provided above the rear wheels. Compartment dimensions 36-1/2" high x 64" wide by 14" deep, with a door opening of 33-1/2" high by 58" wide.

One (1) full height/split depth compartment, with a roll up door, shall be provided behind the rear wheels. Compartment dimensions 68" high x 46" wide x 29" deep in the lower 30" high area, 14" deep in the upper 38" high area, with a door opening of 64" high x 46" wide.

There shall be approximately 96 cu. ft. of storage space in the officer's side compartmentation.

ROLL-UP DOORS

Roll-up doors shall be provided on all compartments. The roll-up doors shall be constructed from aluminum extruded slats which shall have a flexible seal between each slat for proper sealing of the door.

A synthetic rubber seal shall be provided at each side, top and bottom edge of the door to prevent entry of dirt into the compartment.

The door shall be equipped with a lift bar style latch mechanism which shall latch at the bottom of the door mounting extrusion.

The roll-up door assembly shall be furnished with a spring-loaded, counter balance assembly to assist in door actuation.

All running board and high side compartments shall be equipped with roll-up doors.

ROBINSON ROLL-UP DOORS

The roll-up doors shall be Robinson (ROM) brand roll-up doors, equipped with a brushed aluminum finish, with a PVC inner seal to prevent metal to metal contact and to repel moisture. The slats shall be double-wall extrusion 1.366” high by .315” thick with interlocking end shoes to prevent the slats from moving side-to-side and binding the door. All slats are to have interlocking joints to prevent penetration by sharp objects.

SWEEP-OUT COMPARTMENT FLOORS

Compartment floors shall be welded to the compartment walls and have a sweep out design for easy cleaning.

Compartments with hinged doors shall have the door opening flanges bend down to produce the sweep-out design.

Compartments with roll-up style doors shall have the external floor flange stepped down, 1/2" high x 2" deep, to produce a sealing surface for the roll-up doors below the compartment floor. The sweep out design shall also permit easy cleaning.

COATED FASTENERS

All exterior fasteners shall be coated stainless steel screws. Screw threads shall be coated with reusable, self-locking, sealing material to provide vibration resistance. Screw heads shall be coated with a sealing element to prevent galvanic corrosion between dissimilar metals. Non-coated screws shall only be provided as part of vendor supplied component installations.

COMPARTMENT LOUVERS

Ventilation between compartments to atmosphere shall be provided and located to avoid water entry into compartments.

ACCESS PANELS

Removable access panels shall be provided (if applicable) to access fuel tank sender, electrical junction compartment and rear body mounts.

Protective panels shall be located in the rear compartments providing access to the lights and associated wiring. The covers shall also serve as protective covers to prevent inadvertent damage to lights or wiring from tools or equipment located in the compartment.

BODY PROTECTION PANELS

The front face of the side compartments, next to the driver and officer pump panels shall be overlaid with **brushed stainless steel** full height protection panels. The protection panels shall cover the entire front face of the compartments and shall wrap around the corner to the door opening.

REAR BODY PANEL

The rear body panel shall extend the full width between the side compartments. This panel shall be full height from the rear step compartment to the hose bed floor. The panel shall be bolted on and removable, with no part of the rear panel attached to the booster tank. The rear body panel material shall be painted smooth aluminum for Chevron striping.

BODY RUB RAILS

Sacrificial C-Channel style rub rails shall be mounted at the base of the body, extend outward from the body. The rub rails shall extend the full length of the main body. Rub rails shall be designed to bolt to the body from the bottom side of the compartment area, so as not to damage the body side panels on initial impact and to provide for ease of replacement.

RUNNING BOARD STEPS

The driver and officer running board steps shall be fabricated of 3/16" polished aluminum tread plate. The outside edge on each step shall be fabricated with a double break, return flange. The steps shall be rigidly reinforced with a heavy duty support structure. The running boards shall not form any part of the compartment design, and shall be bolted into place with a minimum 1/2" clearance gap between any panel to facilitate water runoff.

REAR STEP

The rear step shall be fabricated from 3/16" polished aluminum tread plate, and shall be rigidly reinforced. The rear step shall extend 12" past the rear edge of the body, and shall be 100" wide, with square corners.

The rear edge of the step shall be designed to accommodate the rear clearance lights, recessed for protection in the step reinforcement channel. The step tread plate overlay shall be bolted to the step frame for ease of replacement.

REAR STEP COMPARTMENT

One (1) rear step compartment 51" high x 42" wide x 29" deep in the lower portion and 12" deep in the upper portion shall be provided with a door opening of 47 5/8" high x 42" wide.

There shall be approximately 35 cu. ft. of storage space in the rear step compartment.

The rear step compartment door shall be a roll-up door. The roll-up door shall be equipped with a brushed aluminum finish.

GRAB RAILS

All hand rails shall be 1-1/4" outer diameter, knurled bright anodized aluminum extrusion, designed to meet NFPA 1901 requirements.

Molded gaskets shall be installed between the handrail stanchion castings and body surfaces to prevent electrolytic reaction between dissimilar metals and to protect paint.

GRAB RAIL LOCATIONS:

Grab rails shall be provided at the following specified locations. Additional grab rails shall be provided adjacent to any additional steps specified to comply with NFPA 1901.

Two (2) vertical rails shall be mounted on the rear edge of the beavertails, one (1) each side.

One (1) horizontal, full width handrail shall be installed on the rear, below the level of the hose bed.

Two (2) vertical handrails shall be mounted above each pump panel, (1) each side.

Two (2) vertical handrails shall be mounted on each side of the forward pump house.

FOLDING STEP(S) - BODY FRONT DRIVER SIDE

Austin Hardware model FS-200 CHR large folding step(s), made of high strength die cast aluminum, with a textured chrome plate finish, shall be provided on driver side body front to provide NFPA compliant access (maximum 18” height between steps) to an upper horizontal walking surface (compartment cap, dunnage area, fabricated step, or upper body compartments).

FOLDING STEP(S) - BODY FRONT OFFICER SIDE

Austin Hardware model FS-200 CHR large folding step(s), made of high strength die cast aluminum, with a textured chrome plate finish, shall be provided on officer side body front to provide NFPA compliant access (maximum 18” height between steps) to an upper horizontal walking surface (compartment cap, dunnage area, fabricated step, or upper body compartments).

FOLDING STEP(S)- BODY REAR DRIVER SIDE

Austin Hardware model FS-200 CHR large folding step(s), made of high strength die cast aluminum, with a textured chrome plate finish, shall be provided on driver side body rear to provide NFPA compliant access (maximum 18” height between steps) to an upper horizontal walking surface (compartment cap, dunnage area, fabricated step, or upper body compartments). The middle step shall be moved outboard.

FOLDING STEP(S) - BODY REAR OFFICER SIDE

Austin Hardware model FS-200 CHR large folding step(s), made of high strength die cast aluminum, with a textured chrome plate finish, shall be provided on officer side body rear to provide NFPA compliant access (maximum 18” height between steps) to an upper horizontal walking surface (compartment cap, dunnage area, fabricated step, or upper body compartments). The second step shall be lowered so a third step can be placed above it.

SAFETY SIGN(S) AT REAR STEP AND CROSS WALKWAY(S)

Safety sign(s) shall be located on the vehicle at the rear step, and at any cross walkway(s), to warn personnel that riding in or on these areas while the vehicle is in motion is prohibited.

REAR WHEEL WELL LINERS

Fully removable, one piece, bolt-in, aluminum rear wheel well liner and fenderette will be provided. The wheel well liners will be natural metal finish and will protect the front and rear compartments and main body supports from damage. Wheel well liners and fenderettes which are welded in place or are only partially removable shall not be considered.

***** BODY FENDER STORAGE COMPARTMENTS *****

DRIVER FRONT FENDER STORAGE

A storage compartment shall be inserted into the front driver side body fender. The compartment shall be sized large enough to store three (3) SCBA cylinders or fire extinguishers, with a maximum length of 26". The compartment shall have a non-abrasive lined floor area for the three (3) devices. The compartment shall be enclosed by a door painted to match the primary body color, with a single point latch and hinge. The back side of the door shall have a section of Nylatron installed to protect the door surface from the items stored in the compartment. This compartment shall be tied into the "Do Not Move Apparatus" warning system.

OFFICER FRONT FENDER STORAGE

A storage compartment shall be inserted into the front officer side body fender. The compartment shall be sized large enough to store three (3) SCBA cylinders or fire extinguishers, with a maximum length of 26". The compartment shall have a non-abrasive floor area for the three (3) devices. The compartment shall be enclosed by a door painted to match the primary body color, with a single point latch and hinge. The back side of the door shall have a section of Nylatron installed to protect the door surface from the items stored in the compartment. This compartment shall be tied into the compartment door ajar/do not move apparatus warning system.

DRIVER REAR FENDER STORAGE

A storage compartment shall be inserted into the rear driver side body fender. The compartment shall be sized large enough to store two (2) SCBA cylinders or fire extinguishers, with a maximum length of 26". The compartment shall have a non-abrasive floor area for the two (2) devices. The compartment shall be enclosed by a door painted to match the primary body color, with a single point latch and hinge. The back side of the door shall have a section of Nylatron installed to protect the door surface from the items stored in the compartment. This compartment shall be tied into the compartment door ajar/do not move apparatus warning system.

OFFICER REAR FENDER STORAGE

A slide out absorbent storage bin shall be installed in the rear officer side body fender. The storage bin shall be constructed of smooth aluminum and shall be sized to store a minimum of 50 lbs. of absorbent material. The bin shall be installed on sliding tracks that allow the bin to extend out of the body fender for dumping/filling. There shall be a hinged lid on top of the storage bin to add material to the bin, and a spring loaded valve at the bottom to dispense material out of the bin. The compartment shall be enclosed by a door painted to match the primary body color, with a single point latch and hinge. The inside of the door shall be covered with 1/8" Nylatron installed to protect the door surface from the items stored in the compartment. This compartment shall be tied into the compartment door ajar/do not move apparatus warning system. The tracks will be non-locking slides.

REAR MUD FLAPS

Heavy duty mud flaps shall be provided behind the rear wheels.

REAR TOW EYES

Two (2) painted tow eyes shall be furnished on the rear of the vehicle. The tow eyes shall be made from plate steel and shall be bolted directly to the chassis frame rails with grade 8 bolts and shall extend below the body. The tow eyes shall be smooth and free from sharp edges, and have a minimum eyelet hole of 2-1/2". The tow eyes shall be painted.

HOSE BED

The hose bed shall be located directly above the booster tank and shall be free from all sharp objects such as bolts, nuts, etc., to avoid damage to fire hose.

The hose bed will provide approximately 210 cubic feet of hose storage area for 2 ½" or larger fire hose, exceeding NFPA 1901 minimum pumper hose storage requirements. The hose bed depth shall be 28".

The apparatus weight analysis will be based on 800' of 2 ½" hose unless otherwise specified. If the hose load to be carried exceeds this minimum, the purchaser must advise the manufacturer prior to contract so adequate chassis carrying capacity can be provided.

For added strength and rigidity, the hose bed side walls shall be (3) inches thick. The top edge of the front wall shall be flanged inward two (2) inches and downward one (1) inch.

HOSE BED FLOORING

Flooring is to be constructed from extruded aluminum and be properly spaced for ventilation. The flooring shall be smooth and free from sharp edges to avoid hose damage. The hose bed floor shall be removable to provide access to inner body framework.

HOSE BED PARTITIONS

Two (2) fully adjustable 3/16", brushed finish, aluminum hose bed partitions shall be provided. Partitions shall be easily adjustable by means of Unistrut channels located at the front and rear of the hose bed. Partitions shall be removable for access to the booster tank.

HOSE PARTITION CUTOUTS

The hose bed partitions shall have a vertical handhold cutout at upper rear edge of the partition.

CUSTOMER REQUIRED HOSE STORAGE CAPACITY

The apparatus hose bed shall be capable of storing the following customer specified hose loads. In addition, the vehicle weight analysis shall be based off of this hose load provided the specified hose load exceeds NFPA minimum standards.

The hose load to be carried shall be as follows:

- 300 feet of 2.5" double jacket hose
- 1200 feet of 5" LDH
- 200 feet of 2.5" double jacket hose

VINYL HOSE BED COVER - 1/4 TURN FASTENERS

A hose bed cover shall be provided and installed. The cover shall be made from 22 ounce; heavy-duty vinyl coated polyester fabric (TXN 226). The cover shall be sewn with ultraviolet resistant thread and shall have 2" wide nylon webbing sewn around the perimeter to provide additional strength.

The cover shall be secured to the top front body flange with quarter-turn fasteners. The cover shall be secured to the side body flanges with Velcro fasteners. A weighted flap shall be furnished on the rear of the cover with two (2) bungee cords.

Hose bed cover hooks shall be placed to the right of the grab rail below the hose bed, not on the rear ladder access door.

The Hypalon material shall be red in color.

****** COMPARTMENT ACCESSORIES ******

HALF DEPTH ADJUSTABLE SHELVING

Compartment shelving shall be constructed of 3/16” brush finish aluminum with a 2” upward bend at front and rear, and side supports. Shelving shall be vertically adjustable with spring nuts in aluminum strut channel.

Half depth adjustable shelves shall be located as follows:

One (1) in the officer side rear compartment

ADJUSTABLE SHELVING

Compartment shelving shall be constructed of 3/16” brush finish aluminum with a 2” upward bend at front and rear, and side supports. Shelving shall be vertically adjustable with spring nuts in aluminum strut channel.

Adjustable shelves shall be located as follows:

One (1) in the officer side front compartment

One (1) in the driver side rear compartment

One (1) in the driver side over the wheel high side compartment

One (1) in the rear step compartment

SLIDE OUT FLOOR MOUNT SHELVING

Slide out floor mount compartment shelving shall be constructed of 3/16” brush finish aluminum with a 2" upward bend at front and rear, and side supports attached to #250 rated slides. Slide out floor mount shelving shall have gas shocks to hold the tray in and out.

Slide out floor mount shelving shall be provided as follows:

One (1) in the officer side rear compartment

One (1) in the rear step compartment

500 POUND FLOOR MOUNTED ROLL OUT TRAYS

Floor mounted roll-out trays shall consist of heavy duty, roller bearing slide tracks with a load rating of 500 pounds, securely fastened to the compartment floor. The tray shall be fabricated from 3/16" brushed aluminum with a minimum 2" high flange on each of the four sides to assist in retaining the equipment stored on each tray. The slide tracks shall have a 70% extension.

The 500 pound floor mounted roll out trays shall be located as follows:

One (1) in the driver side rear compartment

VERTICAL PULL OUT TOOL BOARDS

Vertical pull out tool boards shall be provided. Each tool board shall be constructed of 3/16" smooth aluminum allowing mounting of equipment on both sides of the tool boards. Each tool board shall be attached to #250 rated slides, one at the top and one at the bottom of the tool board. 3/16" aluminum angles shall attach the slides to tracking to allow horizontal adjustments. A gas shock shall be used to secure the tool board in the stored and deployed position.

Vertical pull out tool boards shall be located as follows:

One (1) in the driver side front compartment

LADDER STORAGE

The ground ladders shall be stored vertically next to the water tank, behind the side body compartments, on the officer side of the apparatus.

The manufacturer shall ensure that the ladders do not have excessive free space in the storage compartment that would allow the ladders to shift from side to side when the apparatus is in motion.

To secure the ground ladders, a hinged rear access door shall be provided and tied into the "Do Not Move Apparatus" warning system. The door shall be constructed of smooth aluminum with thumb latches. The inside of the door shall be covered with 1/8" Nylatron.

BACKBOARD STORAGE

The ladder storage area shall be designed to accommodate storage for a backboard, the storage slot shall be sized 18" tall x 2-1/4" wide x 74" long to accommodate a standard size backboard. The storage area shall have nylon material on the bottom surface to protect the backboard.

GROUND LADDERS

The following Alco-Lite ground ladder complement shall be provided:

- One (1) Alco-Lite model PEL-24; 24', aluminum, two (2) section extension ladder shall be provided.
- One (1) Alco-Lite model PRL-14; 14', aluminum, straight roof ladder with folding hooks shall be provided.
- One (1) Alco-Lite model FL-10; 10', folding, aluminum, attic ladder shall be provided.

****** PIKE POLES AND HOLDERS ******

PIKE POLE STORAGE

Two (2) pike pole tube(s) shall be provided. Each holder shall be accessible from the rear of the apparatus. Each pike pole holder shall be labeled to indicate the pike pole length.

The pike pole tube(s) shall be mounted in the ladder storage compartment.

SUCTION HOSE STORAGE

A storage area shall be provided in the body hose bed area to accommodate suction hose storage at the driver side of the hose bed and shall incorporate a fixed partition to isolate the suction hose from the remainder of the hose bed.

The suction hose compartment shall have a stop and a fixed partition. A door shall be provided on the rear of the suction hose storage area. The door shall have 1/8" Nylatron on the inside of the door.

SUCTION HOSE

Two (2) 10 foot sections of six (6) inch PVC lightweight suction hose shall be furnished (Kochek or Firequip Maxi-Flex). Suction hose shall be for suction only and not to be used on pressurized hydrants or for relay pumping. Couplings shall include a long handle, female swivel on one end and a rocker lug male on the other end. All threads shall be six (6) inch N.S.T.

NOTE: All PVC suction hoses are strictly drafting hoses and must not be used on hydrants or in pressure applications, as serious personal injury or death may occur.

STRAINER

One (1) 6" NST, Kochek BS60 barrel type strainer(s) shall be provided to attach to the suction hose. A Kochek MM601 compartment mounting bracket shall also be provided to store the strainer(s) when not in use.

EQUIPMENT CLARIFICATION

The NFPA-1901 recommended double female hydrant adapter shall not be provided by the apparatus manufacturer.

ADDITIONAL ITEMS SUPPLIED WITH THE VEHICLE

- 1 - Pint of touch up paint for each color
- 1 -Bag of assorted stainless steel nuts and bolts

LOOSE EQUIPMENT

The following items shall be provided and shipped loose with the completed apparatus at the time of delivery:

WHEEL CHOCKS

Two (2) ZICO #SAC-44 folding wheel chocks shall be mounted forward of the rear wheels on the driver side below the side running board compartments.

****** PAINT SECTION ******

PAINT, PREPARATION AND FINISH

The apparatus body shall be painted Sikkens [#COL]. The paint process shall meet or exceed current state regulations concerning paint operations. Pollution control shall include measures to protect the atmosphere, water, and soil. Contractor shall, upon demand, provide evidence that the manufacturing facility is in compliance with State EPA rules and regulations.

The exterior shall have no mounted components prior to painting to assure full coverage of metal treatments and paint to the exterior surfaces of the body. Any vertically or horizontally hinged smooth-plate compartment doors shall be painted separately to assure proper paint coverage on body, door jambs and door edges.

Paint process shall feature Sikkens high solid LV products and be performed in the following steps:

- Corrosion Prevention - all aluminum surfaces shall be pre-treated with the Alodine 5700 conversion coating to provide superior corrosion resistance and excellent adhesion of the base coat.
- Sikkens Sealer/Primer LV - acrylic urethane sealer/primer shall be applied to guarantee excellent gloss hold-out, chip resistance and a uniform base color.
- Sikkens High Solid LVBT650 (Base coat) - a lead-free, chromate-free high solid acrylic urethane base coat shall be applied, providing excellent coverage and durability. A minimum of two (2) coats shall be applied.
- Sikkens High Solid LVBT650 (Clear coat) - high solid LV clear coat shall be applied as the final step in order to ensure full gloss and color retention and durability. A minimum of two (2) coats shall be applied.

Any location where the material is penetrated after painting, for the purpose of mounting steps, hand rails, doors, lights, or other specified components shall be treated at the point of penetration with a corrosion inhibiting pre-treatment (ECK Corrosion Control). The pre-treatment shall be applied to the aluminum sheet metal or aluminum extrusions in all locations where the aluminum has been penetrated. All hardware used in mounting steps, hand rails, doors, lights, or other specified components shall be individually treated with the corrosion inhibiting pre-treatment.

After the paint process is complete, the gloss rating of the unit shall be tested with a 20 degree gloss meter. Coating thickness shall be measured with a digital MIL gauge and the orange peel with a digital wave scan device.

BODY PRIMER & PREPARATION

All exposed welds shall be ground smooth for final finishing of areas to be painted. The compartments and doors are totally degreased and phosphatized. After final body work is completed, grinding (36 and 80 grit), and finish sanding shall be used in preparation for priming.

BODY FINISH PAINT

The body shall be finish sanded and prepared for final paint. Upon completion of final preparation, the body shall be painted utilizing the highest quality, state of the art, low V.O.C., polyurethane base paint. Finish paint shall be applied in multiple coats to ensure proper paint coverage with a high gloss finish.

The entire body shall be buffed and detailed.

BODY PAINT

The inside and underside areas of the complete body assembly shall be painted black using a Sikkens paint system, prior to the installation of the body on the chassis or torque box.

COMPARTMENT PAINT

The interior of the compartments shall be finish painted job color with a scuff resistant webbing type paint of a contrasting color applied over the painted surfaces.

BODY PAINT

The body paint finish shall be Sikkens paint system in a single color, to match customer furnished paint codes and requirements.

PUMP / PIPING PAINT

The pump enclosure and pump/plumbing within the pump enclosure shall be painted black.

FENDER STORAGE COMPARTMENT PAINT

The interior of the fender storage compartments (if fender compartments are specified) shall be finish painted job color.

CAB PRIMER & PREPARATION

The cab primer shall be a two (2) stage process. First stage shall be a coating with a two part component, self-etching, corrosion resistant primer to chemically bond the surface of the metal for increased adhesion. Second stage shall be multiple coats of a catalyzed, two components polyurethane, primer applied for leveling of small imperfections and top coat sealing.

CAB FINISH PAINT

The entire cab shall be finish sanded and prepared for final paint. Upon completion of final preparation, the cab shall be painted utilizing the highest quality, state of the art, low V.O.C., polyurethane base paint. Finish paint shall be applied in multiple coats to ensure proper paint coverage with a high gloss finish.

CAB UNDERSIDE PAINT

The exposed areas under the cab shall be painted with a black urethane paint/primer.

The cab exterior shall be painted with Sikkens paint system to match purchaser's furnished paint codes. A two-tone paint finish shall be provided with the two-tone break line located approximately 3" below the cab side windows.

The entire exterior finish of the cab shall be buffed and detailed.

CAB INTERIOR PAINT

The interior metal surfaces of the cab shall be finish painted the same color as the main exterior color.

CHASSIS PAINT

The chassis frame rails, suspension, axles, and drivelines (with the exception of any PTO drivelines which shall be safety yellow) shall be painted black with a polyurethane base paint prior to installation of any air lines or electric systems to ensure proper serviceability.

WHEEL PAINT

The chassis wheels, (except aluminum wheels) shall be painted job color with silver trim around the perimeter. All outer wheels on the rear axle shall be job color with the inner being a color selected by the wheel manufacturer suitable for inner wheel use.

PAINT CODES

The paint shall match customer furnished paint code(s) and layout. The paint code(s) shall be as indicated below:

- **PRIMARY PAINT COLOR**

  Single Color: RED Paint Code# FLNA32065

- **SECONDARY PAINT COLOR**

  Two/Tone Color: WHITE Paint code# FLNA41159

TOUCH-UP PAINT

One (1) pint of each, exterior, color paint for touch-up purposes shall be supplied when the apparatus is delivered to the end user.

CORROSION TREATMENT UNDERCOATING

Upon apparatus completion, underside of the apparatus, from the pump enclosure-back, shall have anti corrosion film applied to help inhibit rust and the corrosion process. The semi-firm wax film shall be applied by air spray method. The film shall be applied as a minimum to the following areas: body substructure, underside of all body compartments, running board supports and rear step supports. No film shall be applied directly to the exhaust system or wheel wells.

NOTE: The film shall remain semi-firm to promote self-sealing. The film may leave a light tinted color to those areas treated.

****** LETTERING AND STRIPING ******

COMPUTER GENERATED LETTERING

The lettering and striping shall be custom designed utilizing state of the art computer software and computerized cutting machines. The manufacturer shall employ a full time artist / designer to generate all lettering, decals, and striping to meet the requirements of the Fire Department. The artwork for the lettering and striping shall be kept on record by the apparatus manufacturer to allow for ease in duplication for the Fire Department.

FRONT CAB DOOR LETTERING

Gold leaf, "Sign Gold", with drop shadow lettering shall be provided on the cab driver and officer's doors per the fire department requirements. The design of the lettering on the cab doors shall be designed to fit in the 496 sq. inches available.

Lettering provided on the driver's and officer's cab doors shall be 3" high.

REAR CAB DOOR LETTERING

Gold leaf, "Sign Gold", with drop shadow lettering shall be provided on the cab crew doors per the fire department requirements. The design of the lettering on the cab doors shall be designed to fit in the 496 sq. inches available.

Lettering provided on the crew cab doors shall be 3" high.

FRONT BUMPER LETTERING

Scotch-Lite with drop shadow lettering shall be provided on the front bumper per the fire department requirements. The design of the lettering on the front bumper shall be designed to fit in the available area.

Lettering provided on the front bumper shall be 3" high.

REAR BODY LETTERING

Scotch-Lite with drop shadow lettering shall be provided on the rear compartment door per the fire department requirements. The design of the lettering on the rear of the body shall be designed to fit in the available area.

REAR BODY

Lettering provided on the rear compartment door shall be custom height per Fire Department and engineering design.

BODY SIDE SHEET LETTERING

Scotch-Lite without drop shadow lettering shall be provided on the body side sheet per the fire department requirements. The design of the lettering on the body side sheet shall be designed to fit in the 2500 sq. inches available.

Lettering provided on the body side sheet shall be 6" high.

LETTERING FONT

The lettering shall be designed and cut with a basic block type font:

"BLOCK TYPE FONT"

STANDARD MALTESE CROSS DESIGN 1

A pair of standard Maltese crosses shall be computer generated and will be no larger than the 496 sq. inches available.

The standard logo shall be printed on Scotch-Cal with two computer generated printed colors.

The Maltese cross shall be located as directed by the Fire Department.

****** NFPA REQUIRED SCOTCH-LITE STRIPING ******

SCOTCH-LITE STRIPE

A four (4) inch high "Scotch-Lite" stripe shall be provided. The stripe shall be applied on a minimum of 60 percent of each side of the unit, 60 percent on the rear of the unit and 40 percent on the front of the unit. The Scotch-Lite stripe layout shall be determined by the Fire Department.

The Scotch-Lite shall be white in color.

REAR CHEVRON STRIPING

The entire rear of the truck shall be covered with alternating strips of reflective striping.

The striping shall be 6" Scotch-Lite.

The Scotch-Lite shall be Ruby Red and Lemon Yellow in color.

******* WARRANTIES & REQUIRED INFORMATION *******

WARRANTY, STARTING ON DELIVERY DATE

Warranty coverage by the manufacturer shall begin on the date of delivery to the customer.

WARRANTY - CUSTOM CHASSIS

The specified vehicle shall include a one (1) year new vehicle warranty, upon delivery and acceptance of the vehicle. The warranty shall ensure that the vehicle has been manufactured to the proposed contract specifications and shall be free from defects in material and workmanship that may appear under normal use and service within the warranty period. The warranty may be subject to different time and mileage limitations for specific components and parts. This warranty is issued to the original purchaser of the vehicle.

The warranty shall not apply to tires, batteries, or other parts or components that are warranted directly by their manufacturers. The warranty shall not apply to routine maintenance requirements as described in the service and operators manual. No warranty whether express, implied, statutory or otherwise including, but not limited to any warranty of merchantability or fitness for purpose shall be imposed.

OVERALL UNIT AND CUSTOM CHASSIS

All components and parts of the vehicle are warranted for a period of one (1) year from acceptance of the vehicle, unless excluded elsewhere in this warranty or described as having longer time limitations.

WARRANTY - ENGINE

The specified fire service rated engine shall be provided with a five (5) year engine manufacturer's warranty. A copy of the manufacturer's warranty shall be supplied to define additional details of the warranty provisions.

WARRANTY - TRANSMISSION

The specified Allison transmission shall be provided with a five (5) year warranty. A copy of the Allison transmission warranty shall be supplied to the purchaser to define additional details of the warranty provisions.

WARRANTY - COOLING SYSTEM - CUSTOM CHASSIS

The manufacturer warrants all Cooling System Equipment components used in the construction of the manufacturer's fire apparatus against defects and workmanship provided the apparatus is used in a normal and reasonable manner. This warranty is extended only to the original user-purchaser for a period of three (3) years from the date of delivery / acceptance to the original user-purchaser, whichever occurs first.

This warranty applies to both purchased and fabricated, manufacturer supplied, coolant system components, and is not provided in lieu of any Vendor provided warranties. All coolant system components provided by the engine manufacturer are covered by the engine manufacturer's warranty only.

WARRANTY - CUSTOM CHASSIS FRAME RAILS

The purchaser requires that the custom chassis frame shall be warranted for the lifetime of the vehicle

CROSSMEMBERS WARRANTY

A lifetime warranty shall be provided on all chassis frame cross members.

WARRANTY - STEERING UNIT

The proposed Sheppard steering gear shall be warranted for a period of three (3) years from the first date of service or 150,000 miles (241,401 kilometers), whichever occurs first. The product shall be free from defects in material and workmanship under normal use in applications approved in advance by Sheppard.

WARRANTY - FRONT AXLE

The Meritor axle/s shall be furnished with a five (5) year warranty; the first two (2) years shall be parts and labor, the remaining three (3) years shall be parts only. Wheel seals, gaskets and wheel bearings will be covered for one (1) year providing that Meritor supplies and assembles the wheel end equipment. A copy of the warranty from Meritor shall be supplied to define additional details of the warranty provisions. For vehicles that operate full or part time outside of the United States and Canada, a one (1) year parts only warranty shall apply.

WARRANTY - REAR AXLE

The Meritor axle/s shall be furnished with a five (5) year warranty; the first two (2) years shall be parts and labor, the remaining three (3) years shall be parts only. Wheel seals, gaskets and wheel bearings will be covered for one (1) year providing that Meritor supplies and assembles the wheel end equipment. A copy of the warranty from Meritor shall be supplied to define additional details of the warranty provisions. For vehicles that operate full or part time outside of the United States and Canada, a one (1) year parts only warranty shall apply.

WARRANTY - ABS

The Meritor ABS shall be provided with a three (3) year warranty, parts and labor. A copy of Meritor's warranty will be supplied to define additional details of the warranty provisions. Vehicles that operate full or part time outside the United States and Canada will have a one (1) year, parts only warranty.

WARRANTY - CAB STRUCTURE

The cab shall be warranted against structural defects for a period of ten (10) years from the date of acceptance of the unit. Details of warranty coverage, limitations and exclusions are included in the specific warranty document.

WARRANTY - BODY STRUCTURE

The body shall be warranted against structural defects for a period of ten (10) years from the date of acceptance of the unit. Details of warranty coverage, limitations and exclusions are included in the specific warranty document.

WARRANTY - CORROSION

The cab and body shall be warranted against rust-through or perforation, due to corrosion from within, for a period of ten (10) years. Perforation is defined as a condition in which an actual hole occurs in a sheet metal panel due to rust or corrosion from within. Surface rust or corrosion caused by chips or scratches in the paint is not covered by this warranty.

WARRANTY - PAINT

The paint finish shall be warranted for a period of ten (10) years from the date of acceptance of the unit. Details of warranty coverage, limitations and exclusions are included in the specific warranty document.

WARRANTY - LETTERING

The apparatus manufacturer will provide a five (5) year warranty against defects in material and workmanship for all graphic processes. Any valid claims must be made in writing within 15 days of the determination of any defects to the manufacturer's fire apparatus. The manufacturer will at its option make any necessary repairs either at a local authorized service center or at the factory, if required. The manufacturer will make the final decision as to where the repairs are to be made and any transportation cost are the owner's responsibility. The manufacturer will at its option, repair or replace any verified defects in workmanship or materials at no cost to the owner provided all the requirements of this warranty have been met.

The manufacturer will not be liable to the original purchaser or anyone else for consequential, incidental, special or direct damages, including, but not limited to, any claims for loss of profits, down time, loss of use or inconvenience. THE COMPANY MAKES NO OTHER WARRANTY, EXPRESSED OF IMPLIED, AND SPECIFICALLY, DISCLAIMS ANY IMPLIED WARRANTY INCLUDING THE WARRANTY OF MERCHANTABILITY.

The manufacturer continually strives to improve its products and therefore, reserves the right to make improvements or changes without incurring any obligations to make such changes or additions on equipment previously sold.

WARRANTY - BRIGHTWORK

The manufacturer warrants all bright finish components used in the construction of their apparatus against defects and workmanship provided the apparatus is used in a normal and reasonable manner. This warranty is extended only to the original user-purchaser for a period of one (1) year from the date of delivery / acceptance to the original user-purchaser, whichever occurs first.

The expressed warranty excludes corrosion or degradation of bright finished components caused by damage to the component.

WARRANTY - STAINLESS STEEL PLUMBING WARRANTY

The stainless steel plumbing shall be warranted for a period of ten (10) years from the date of acceptance of the unit. Details of warranty coverage, limitations and exclusions are included in the specific warranty document.

WARRANTY - REAR SUSPENSION

The manufacturer hereby warrants to the original Buyer, that leaf spring products installed shall be free of defects in material and workmanship for one (1) year. The “Warranty Period” commences on the date the original Buyer takes delivery of the product from the manufacturer.

WARRANTY - WATER TANK

The water tank shall be warranted by the water tank manufacturer for the "Lifetime" of the unit. A copy of the manufacturer's warranty shall be supplied to define additional details of the warranty provisions.

WARRANTY - FIRE PUMP

Hale Products, Incorporated ("Hale") hereby warrants to the original buyer that products manufactured by Hale shall be free of defects in material and workmanship for a period of five (5) years from the date product is first placed into service or five and one-half (5 1/2) years from date of shipment by Hale, whichever period shall be first to expire. Within this warranty period Hale will cover parts and labor for the first two (2) years and parts only for years three (3) through five (5).

WARRANTY - FOAM SYSTEM

The liability of FoamPro under the foregoing warranty shall be limited to the repair or replacement at FoamPro’s option without charge for labor or materials of any parts upon return of the entire pump, system or other product or of the particular part to the FoamPro factory within the warranty period, at the sole expense of the purchaser, which part shall upon examination appear to FoamPro’s satisfaction to have been defective in material and workmanship.

WARRANTY - HEAVY DUTY VALVES

Akron Brass warrants Heavy Duty Swing-Out Valves for a period of ten (10) years after purchase against defects in material or workmanship. Akron Brass shall repair or replace any Heavy Duty Swing Out Valve which fails to satisfy this warranty.

WARRANTY - SEATING

HO Bostrom shall warrant each new seat manufactured, to be free from defects in materials and workmanship when delivered to the original purchaser for a period of five (5) years.

Labor to remove or reinstall and transportation of defective items will not be covered by, or any allowance made for said cost under this warranty.

NFPA REQUIRED LOOSE EQUIPMENT, PROVIDED BY FIRE DEPARTMENT

The following loose equipment as outlined in NFPA 1901, 2016 edition in accordance with the applicable requirements unless supplied by the manufacturer or sales rep organization, will be provided by the fire department. All loose equipment will be installed on the apparatus before placed in emergency service, unless the fire department waives NFPA section 4.21.

Section 5.7 Equipment

It is the responsibility of the purchaser to ensure that all required equipment has been supplied and installed on the apparatus in order to achieve compliance with the standard prior to placing it in service.

5.7.1 Ground Ladders.
5.7.1.1 All fire department ground ladders carried on the apparatus shall meet the requirements of NFPA 1931, Standard for Manufacturer's Design of Fire Department Ground Ladders, except as permitted by 5.7.1.3 and 5.7.1.4.
5.7.1.2 At a minimum, the following fire department ground ladders shall be carried on the apparatus:
(1) One straight ladder equipped with roof hooks
(2) One extension ladder
(3) One folding ladder

5.7.1.3 Stepladders and other types of multipurpose ladders meeting ANSI AI4.2, Ladders - Portable Metal- Safety Requirements, or ANSI A14.5, Ladders - Portable Reinforced Plastic Safely Requirements, with duty ratings of Type IA or lAA shall be permitted to be substituted for the folding ladder required in 5.7.1.2(3).
5.7.1.4 Stepladders and other types of multipurpose ladders shall be permitted to be carried in addition to the minimum fire department ground ladders specified in 5.7.1.2 provided they meet either ANSI AI4.2 or ANSI A14.5 with duty ratings of Type 1A or 1AA.

Section 5.7.2 Suction Hose or Supply Hose

It is the responsibility of the purchaser to ensure that all required equipment has been supplied and installed on the apparatus in order to achieve compliance with the standard prior to placing it in service.

5.7.2.1 A minimum of 20 ft (6 m) of suction hose or 15 ft (4.5 m) of supply hose shall be carried.
5.7.2.1.1 Where suction hose is provided, a suction strainer shall be furnished.
5.7.2.1.2 Where suction hose is provided, the friction and entrance loss of the combination suction hose and strainer shall not exceed the losses listed in Table 16.2.4.1 (b) or Table 16.2.4.1(c).
5.7.2.1.3 Where supply hose is provided. It shall have couplings compatible with the local hydrant outlet connection on one end and the pump intake connection on the other end.
5.7.2.2 Suction hose and supply hose shall meet the requirements of NFPA 1961, Standard on Fire Hose.

Section 5.8 Minor Equipment

It is the responsibility of the purchaser to ensure that all required equipment has been supplied and installed on the apparatus in order to achieve compliance with the standard prior to placing it in service.

5.8.2 Fire Hose and Nozzles. The following fire hose and nozzles shall be carried on the apparatus:
(1) 800 ft (240 m) of 2 1/2 in. (65 mm) or larger fire hose
(2) 400 ft (120 m) of 1 1/2 in. (38 mm), 1 3/4 in. (45 mm), or 2 in. (52 mm) fire hose
(3) One hand line nozzle. 200 gpm (750 L/min) minimum
(4) Two hand line nozzles. 95 gpm (360 L/min) minimum
(5) One play pipe with shutoff and 1 in. (25 mm), 1 1/8 in. (29 mm), and l 1/4 in. (32 mm) tips

5.8.3 Miscellaneous Equipment. The following additional equipment shall be carried on the apparatus:
(1) One 6 lb (2.7 kg) flathead axe mounted in a bracket fastened to the apparatus

(2) One 6 lb (2.7 kg) pick head axe mounted in a bracket fastened to the apparatus
(3) One 6 ft (2 m) pike pole or plaster hook mounted in a bracket fastened to the apparatus
(4) One 8 ft (2.4 m) or longer pike pole mounted in a bracket fastened to the apparatus
(5) Two portable hand lights mounted in brackets fastened to the apparatus
(6) One approved dry chemical portable fire extinguisher with a minimum 80-B:C rating mounted in a bracket fastened to the apparatus
(7) One 2 1/2 gal (9.5 L) or larger water extinguisher mounted in a bracket fastened to the apparatus
(8) One self-contained breathing apparatus (SCBA) complying with NFPA 1981, Standard on Open-Circuit Self Contained Breathing Apparatus (SCBA) for Emergency Services, for each assigned sealing position. But not fewer than four, mounted in brackets fastened to the apparatus or stored in containers supplied by the SCBA manufacturer
(9) One spare SCBA cylinder for each SCBA carried, each mounted in a bracket fastened to the apparatus or stored in a specially designed storage space
(10) One first aid kit
(11) Four combination spanner wrenches mounted in brackets fastened to the apparatus
(12) Two hydrant wrenches mounted in brackets fastened to the apparatus
(13) One double female 2 1/2 in. (65 mm) adapter with National Hose (NH) threads, mounted in a bracket fastened to the apparatus
(14) One double male 2 1/2 in. (65 mm) adapter with NH threads, mounted in a bracket fastened to the apparatus
(15) One rubber mallet, suitable for use on suction hose connections, mounted in a bracket fastened to the apparatus
(16) Two salvage covers each a minimum size of 12 ft x 14 ft (3.7 m x 4.3 m)
(17) Two or more wheel chocks. Mounted in readily accessible locations, that together will hold the apparatus. When loaded to its GVWR or GCWR, on a hard surface with a 20 percent grade with the transmission in neutral and the parking brake released
(18) One traffic vest for each seating position, each vest to comply with ANSI/ISEA 207, Standard for High-Visibility Public Safety Vests, and have a five-point breakaway feature that includes two at the shoulders, two at the sides, and one at the front
(19) Five fluorescent. orange traffic cones not less than 28 in. (711 mm) in height, each equipped with a 6 in. (152 mm) retroflective white band no more than 4 in. (102 111m) from the top of the cone, and an additional 4 in. (102 mm) retroflective white band 2 in. (51 mm) below the 6 in. (152 mm) hand
(20) Five illuminated warning devices such as highway flares, unless the live fluorescent orange traffic cones have illuminating capabilities
(21) One automatic external defibrillator (AED)

5.8.3.1 If the supply hose carried does not use sexless couplings, an additional double female adapter and double male adapter, sized to fit the supply hose carried, shall be carried mounted in brackets fastened to the apparatus.
5.8.3.2 If none of the Pump intakes are valved, a hose appliance that is equipped with one or more gated intakes with female swivel connection(s) compatible with the supply hose used on one side and a swivel connection with pump intake threads on the other side shall be carried. Any intake connection larger than 3 in. (75 mm) shall include a pressure relief device that meets the requirements of 16.6.6.
5.8.3.3 If the pumper is equipped with an aerial device with a permanently mounted ladder, four ladder belts meeting the requirements of NFPA 1983, Standard on Life Safety Rope and Equipment for Emergency Services shall be provided.
5.8.3.4 If the apparatus does not have a 2 1/2 in. intake with NH threads, an adapter from 2 1/2 in. NH female to a pump intake shall be carried, mounted in a bracket fastened to the apparatus if not already mounted directly to the intake.
5.8.3.5 If the supply hose carried has other than 2 1/2 in. NH threads, adapters shall be carried to allow feeding the supply hose from a 2 1/2 in. NH thread male discharge and to allow the hose to connect to a 2 1/2 in. NH female intake, mounted in brackets fastened to the apparatus if not already mounted directly to the discharge or intake.

14.1.8.4 Fire Helmet

It is the responsibility of the purchaser to ensure that "Fire helmets shall not be worn by persons riding in enclosed driving and crew areas any time the apparatus in placed in service.

14.1.8.4.1 A location for helmet storage shall be provided.
14.1.8.4.2 If helmets are to be stored in the driving or crew compartment, the helmets shall be secured in compliance with 14.1.11.2.

14.1.10 SCBA Mounting

It is the responsibility of the purchaser to ensure that any SCBA equipment has been supplied and installed on the apparatus in order to achieve compliance with the standard prior to placing it in service.

14.1.10.1 Where SCBA units are mounted within a driving or crew compartment, a positive latching mechanical means of holding the SCBA device in its stowed position shall he provided such that the SCBA unit cannot be retained in the mount unless the positive latch is engaged.
14.1.10.2 The bracket holding device and its mounting shall retain the SCBA unit when subjected to a 9 G force and shall be installed in accordance with the bracket manufacturer's requirements.
14.1.10.3 If the SCBA unit is mounted in a seat back, the release mechanism shall be accessible to the user while seated.

14.1.11 Equipment Mounting

It is the responsibility of the purchaser to ensure that any equipment installed on the apparatus by them or their subcontractor meets the following requirements prior to placing it in service.

14.1.11.1 All equipment required to be used during an emergency response shall be securely fastened.
14.1.11.2 All equipment not required to be used during an emergency response, with the exception of SCBA units, shall not be mounted in a driving or crew area unless it is contained in a fully enclosed and latched compartment capable of containing the contents when a 9 G force is applied in the longitudinal axis of the vehicle or a 9G force is applied in any other direction, or the equipment is mounted in a bracket(s) that can contain the equipment when the equipment is subjected to those same forces.

Section 15.9.3 Reflective Striping

It is the responsibility of the purchaser to ensure that Reflective Striping has been supplied and installed on the apparatus in order to achieve compliance with the standard prior to placing it in service.

15.9.3.1"' A retro reflective stripe(s) shall be affixed to at least 50 percent of the cab and body length on each side, excluding the pump panel areas, and at least 25 percent of the width of the front of the apparatus.
15.9.3.1.1 The stripe or combination of stripes shall be a minimum of 4 in. (100 mm) in total width.
15.9.3.1.2 The 4 in. (100 mm) wide stripe or combination of stripes shall be permitted to be interrupted by objects (i.e., receptacles, cracks between slats in roll up doors) provided the full stripe is seen as conspicuous when approaching the apparatus.

15.10 Hose Storage

It is the responsibility of the purchaser to ensure that any hose storage area includes a positive means to prevent unintentional deployment in order to achieve compliance with the standard prior to placing it in service.

15.10.7 Any hose storage area shall be equipped with a positive means to prevent unintentional deployment of the hose from the top, sides, front, and rear of the hose storage area while the apparatus is underway in normal operations.

LOOSE EQUIPMENT TO BE PROVIDED BY DEALER

The following loose equipment shall be provided and installed by the dealer prior to delivery:

3 EA 4000-23 Elkhart Chief Nozzle, 1.5" Mid-Range 200 GPM @ 75 PSI
3 EA 4000-28 Elkhart Chief Nozzle, 2.5"w/PG (Specify GPM & PSI)
4 EA 44311 Streamlight Fire Vulcan 180, Orange LED With 12 Volt Vehicle Mount
2 EA 36R15MNST15MNST Kochek Adapter 1.5" MNST x 1.5" MNST
2 EA 35R15FNST15FNST Kochek Adapter 1.5" FNST X 1.5" FNST
2 EA 36R25MNST25MNST Kochek Adapter 2.5" MNST x 2.5" MNST
2 EA 35R25FNST25FNST Kochek Adapter 2.5" FNST x 2.5" FNST
2 EA 37R25FNST15MNST Kochek Adapter 2.5" FNST X 1.5" MNST
1 EA KS34 Kochek Storz Wrenches w/ Holder , Set of 4
3 EA K45-3 Kochek Wrenches w/ Holder, Set of (1) K05 (2) K01
2 EA S54L50STZ45FNST Kochek Adapter 5.0"Stz X 4.5"LF FNST
1 EA S54L50STZ60FNST Kochek Swivel Adapter 5"Storz X 6"FNST Long Handle
2 EA KS3 Kochek Storz & Universal Spanner Wrench, 4" x 5"
1 EA K03-H-838195 KOCHEK HYDRANT HAMMER
1 EA PHY6 Akron Axe, Pick Head, 36", Fiberglass Handle, 6 LB
1 EA 69127 Nupla Square Point Shovel, 27" D-Handle
2 EA CWH4SD Nupla Ceiling/Wall Hook 4' D-Grip
1 EA K12FD94 Team Saw, K12 Rescue 94cc, Saw Only
1 EA RH-4 FIRE HOOKS 4' NY ROOF HOOK
1 EA ELSS-XLDC Akron Scene Star, Head Only LED, 19000 Lumens
1 EA 244 Elkhart Foam Aeration Tube, Elk-O-Lite
1 EA 1193 Aervoe 28" Collapsible Cone Kit, Org, 5/PK, Case, LED Light
14 EA QL48Z25C South Park Quick Mount Plate, Chrome 2.5"
2 EA 1042-2 PAC Mount, for 2.5" Double Female Adapter
2 EA 1042-2 PAC Mount, for 2.5" Double Male Adapter
17 EA 1003 PAC Toolok 1/8"-1 1/2"
1 EA 1009 PAC Tool Hanger
4 EA 1004-2 PAC Handlelok 1/8"-1 3/4", Black
1 EA 1010-2 PAC Sledge Hammer Pocket, 8#
3 EA 1006 PAC Adjustamount
6 EA 1070 PAC Jumbo Lock
2 EA 1080 PAC Soft Mount
1 EA K5026 PAC Spreader Base Kit
2 EA VM-5 Zico Bracket, Horizontal Variable, 1"-1.3"

2 EA QM-CWH Zico Ceiling&Wall Tool Holder
1 EA QM-AH Zico Bracket, Adapter
2 EA QM-CSM-L Zico Bracket, Chainsaw Large
2 EA QM-RGC-9 Zico Bracket, Round Safety Can 9" Diameter
1 EA KTK Firehooks K-Tool Kit - Lock Puller
1 EA OTK16 Firehooks A-Tool Kit
1 EA 1088-3 Akron Piercing Nozzle, 3', 1.5"
2 EA 1042-1 PAC MOUNT FOR 1.5" DOUBLE FEMALE ADAPTER
2 EA 1042-1 PAC MOUNT FOR 1.5" DOUBLE MALE ADAPTER
1 EA PC360FNSTX60MNST PRECON VALVE,6"FMNST SWIVEL X6"MNST
1 EA EU-2200i HONDA 2200 WATT, RECOIL START GENERATOR

Loose Equipment Price Sheet

The following loose equipment, brackets, and tools will be priced as individual line items. The City reserves the right to select or reject any or all of these items.

QTY.	ITEM DESCRIPTION	UNIT PRICE	EXTENDED PRICE
3	4000-23 Elkhart Chief Nozzle, 1.5" Mid-Range 200 GPM @ 75 PSI		
3	4000-28 Elkhart Chief Nozzle, 2.5"w/PG (Specify GPM & PSI)		
4	44311 Streamlight Fire Vulcan 180, Orange LED With 12 Volt Vehicle Mount		
2	36R15MNST15MNST Kochek Adapter 1.5" MNST x 1.5" MNST		
2	35R15FNST15FNST Kochek Adapter 1.5" FNST X 1.5" FNST		
2	36R25MNST25MNST Kochek Adapter 2.5" MNST x 2.5" MNST		
2	35R25FNST25FNST Kochek Adapter 2.5" FNST x 2.5" FNST		
2	37R25FNST15MNST Kochek Adapter 2.5" FNST X 1.5" MNST		
1	KS34 Kochek Storz Wrenches w/ Holder , Set of 4		
3	K45-3 Kochek Wrenches w/ Holder, Set of (1) K05 (2) K01		
2	S54L50STZ45FNST Kochek Adapter 5.0"Stz X 4.5"LF FNST		
QTY.	**ITEM DESCRIPTION**	**UNIT PRICE**	**EXTENDED PRICE**
1	S54L50STZ60FNST Kochek Swivel Adapter 5"Storz X 6"FNST Long Handle		
2	KS3 Kochek Storz & Universal Spanner Wrench, 4" x 5"		

1	K03-H-838195 KOCHEK HYDRANT HAMMER		
1	PHY6 Akron Axe, Pick Head, 36", Fiberglass Handle, 6 LB		
1	69127 Nupla Square Point Shovel, 27" D-Handle		
2	CWH4SD Nupla Ceiling/Wall Hook 4' D-Grip		
1	K12FD94 Team Saw, K12 Rescue 94cc, Saw Only		
1	RH-4 FIRE HOOKS 4' NY ROOF HOOK		
1	ELSS-XLDC Akron Scene Star, Head Only LED, 19000 Lumens		
1	244 Elkhart Foam Aeration Tube, Elk-O-Lite		
1	1193 Aervoe 28" Collapsible Cone Kit, Org, 5/PK, Case, LED Light		
14	QL48Z25C South Park Quick Mount Plate, Chrome 2.5"		
2	1042-2 PAC Mount, for 2.5" Double Female Adapter		
2	1042-2 PAC Mount, for 2.5" Double Male Adapter		
17	1003 PAC Toolok 1/8"-1 1/2"		
1	1009 PAC Tool Hanger		
4	1004-2 PAC Handlelok 1/8"-1 3/4", Black		
1	1010-2 PAC Sledge Hammer Pocket, 8#		
3	1006 PAC Adjustamount		
QTY.	**ITEM DESCRIPTION**	**UNIT PRICE**	**EXTENDED PRICE**
6	1070 PAC Jumbo Lock		
2	1080 PAC Soft Mount		
1	K5026 PAC Spreader Base Kit		

2	VM-5 Zico Bracket, Horizontal Variable, 1"-1.3"		
2	QM-CWH Zico Ceiling&Wall Tool Holder		
1	QM-AH Zico Bracket, Adapter		
2	QM-CSM-L Zico Bracket, Chainsaw Large		
2	QM-RGC-9 Zico Bracket, Round Safety Can 9" Diameter		
1	KTK Firehooks K-Tool Kit - Lock Puller		
1	OTK16 Firehooks A-Tool Kit		
1	1088-3 Akron Piercing Nozzle, 3', 1.5"		
2	1042-1 PAC MOUNT FOR 1.5" DOUBLE FEMALE ADAPTER		
2	2 EA 1042-1 PAC MOUNT FOR 1.5" DOUBLE MALE ADAPTER		
1	PC360FNSTX60MNST PRECON VALVE,6"FMNST SWIVEL X6"MNST		
1	EU-2200i HONDA 2200 WATT, RECOIL START GENERATOR		
		TOTAL LOOSE EQUIPMENT PRICE	

Company: _____

Submitted By: _____

Address: _____

_____

Phone: _____

CUSTOM PUMPER

PRICE SHEET

Requisition No. FD-110718

ITEM DESCRIPTION	UNIT PRICE
Apparatus Bid Price *(Price to include delivery to the City of Foley)*	$ _____
Total Loose Equipment Price	$ _____
Total Bid Price *(Apparatus and Total Loose Equipment Price)*	$ _____
100% Prepayment Discount	$ _____

Please submit an original bid packet with one (1) duplicate copy.

Company: _____

Submitted By: _____

Address: _____

_____

Phone: _____

THE CITY OF FOLEY, ALABAMA
GENERAL CONDITIONS

To insure acceptance, all bidders submitting bids to the City of Foley shall be governed by the following conditions, attached specifications, and bid form(s) unless otherwise specified. Bids **not** submitted on the bid form(s) provided may be rejected, and bids **not** complying with these conditions will be subject to rejection.

1.0 Intent of Specifications:

It is the intent of the specifications attached hereto to set forth and describe certain item(s) or service(s) to be purchased by the City of Foley including all materials, equipment, machinery, tools, apparatus, and means of transportation (meaning freight costs) necessary to provide these items or services.

1.01 Legal Requirements:

All applicable provisions of Federal, State, County and local laws including all ordinances, rules and regulations shall govern the development, submittal and evaluation of all bids received in response to these specifications, and shall govern any and all claims between person(s) submitting a bid response hereto and the City of Foley, by and through its officers, employees and authorized representatives. A lack of knowledge by the bidder concerning any of the aforementioned shall not constitute a cognizable defense against the legal effect thereof.

1.02 Sealed Bids:

The specifications and all executed bid forms must be submitted in a sealed envelope. All proposals must be signed by an authorized representative of the bidder. In the event more than one bid opening is scheduled for the same date and time, do not include bids concerning different sets of specifications within the same envelope. **The face of the envelope shall be plainly marked identifying the bid requisition number and opening date and time.** It shall be the sole responsibility of the bidder to assure receipt of bid at the Purchasing Office prior to the published time for the bid opening. No bid will be opened that is received after closing time for receipt of bids, nor will any offers by telephone, fax, or any electronic means be accepted.

1.03 Exceptions to Specifications:

During the drafting of written specifications, a sincere effort is made to describe products and services best suited to the needs of the City; however, in order that fair consideration is given in evaluating bids, all exceptions to or deviations from the specifications as written must be noted and fully explained. The Mayor and City Council are the final authority in determining the acceptability of any exceptions to specifications.

1.04 Discounts:

Terms offering a discount for prompt payment will be considered in determining the low bid. The discount period shall begin whenever (1) the conditions of the specifications have been fully met and the product or service judged acceptable to the City of Foley or (2) a correct invoice and other required documents have been received, whichever is later. Discounts offered for a period of less than thirty (30) days will not be considered in determining the low bid.

1.05 Approved Equivalents or Equals:

Any manufacturer's names, trade names, brand names, model numbers, etc. listed in the specifications are for information only and not intended to limit competition. The bidder may offer any brand for which he is an authorized representative that meets or exceeds the specifications as written. If the bid is based on an "approved equivalent or equal" item, supportive information in the form of manufacturer's printed literature or brochures, sketches, diagrams and/or complete specifications must accompany the bid. The bidder must explain in detail the reasons why the proposed equivalent or equal will meet specifications and not be considered an exception thereto. The City of Foley reserves the right to determine acceptance of proposed equivalent or equal item.

1.06 Bid Withdrawals:

Bids may be withdrawn by written request received from bidders prior to the time fixed for opening but no bid may be withdrawn after closing time for receipt of bids for a period of sixty (60) days. Negligence on the part of the bidder in preparing the bid confers no right for the withdrawal of the bid after it has been opened.

1.07 Rejection of Bids:

The City of Foley reserves the right to accept or reject any or all bids, to award bids on a split-order basis, to waiver any minor bid irregularities, technicalities, or informalities, and to re-advertise for bids when deemed in the best interest of the City of Foley.

If there is any reason for believing that collusion exists among the bidders, any or all proposals may be rejected, and those participating in such collusion may be barred from submitting bids on the same or other work with the City of Foley.

1.08 Delivery:

Bid quotations shall include all freight cost to Foley, Alabama to point(s) specified herein or specified at the time the purchase order is placed. No title to the item(s) ordered nor any risk of loss shall be passed to the City of Foley until after receipt of delivery has been acknowledged by an authorized representative of the City of Foley.

1.09 Taxes:

The City of Foley, a Municipal Corporation, is a tax exempt entity per Section 40-23-4(11), Code of Alabama 1975. The City of Foley is exempt from all state and local sales taxes. This should **not** be construed to mean that contractors or suppliers doing business with the City of Foley are exempt from paying tax (General Conditions, Section 1.11 Permits and Taxes).

1.10 Licenses, Registration and Certificates:

A City of Foley Business License must be obtained within ten days of bid award. Each bidder must provide proof of State required competency certifications whenever applicable to engage in the business of contracting (or special contracting if the work to be performed necessitates a particular type of specialty contractor) in the City of Foley.

1.11 Permits and Taxes:

The contractor shall procure all permits, pay all charges, fees and taxes and give all notices necessary and incidental to the due and lawful prosecution of the work.

1.12 Compliance with Federally Funded Programs:

The successful bidder shall assure the City of compliance with any and all special provisions (if applicable) contained in the contract being bid. These provisions may include but are not limited to maintaining a Drug-

Free Workplace, compliance with Clean Air and Water Laws and Regulations, and compliance with Equal Opportunity and Non-Segregated Facilities guidelines.

1.13 Proof of Liability & Worker's Comp Insurance:

If applicable, Proof of Liability and/or Worker's Comp Insurance must be included in the bid packet. If a company is not covered by Worker's Comp Insurance, labor and material charges should be separated on the bid/proposal. This should be done in order for the City to determine the Worker's Comp rate (in accordance with the City's current Worker's Comp fee schedule) that will be deducted from payment to the company performing the work.

1.14 Background Check:

The bid award of "Public Works" projects over $50,000 will be contingent upon the results of a background check of the successful low bidder as stated in Ordinance No. 1029-08. According to this ordinance, the City of Foley will take criminal histories into account when deciding whether a low bidder is qualified to do work for the City.

1.15 Disqualification:

The City can disqualify a company based upon the results of a background check or if the company has been prohibited from contracting with another government agency as stated in Ordinance No. 1029-08.

If, in the opinion of The City of Foley, a sealed bid contains false or misleading statements or references that do not support a function, attribute, capability, or condition as contended by Company, the sealed bid may be disqualified from further consideration.

1.16 Expenses:

Expenses for developing sealed bids and addressing information requests herein are solely and entirely the responsibility of Company and shall not be chargeable in any manner to the City of Foley.

1.17 Beason-Hammon Act:

Must be in compliance with the Beason-Hammon Alabama Taxpayer and Citizen Protection Act, Act No. 2011-535 dealing with immigration (Immigration Act).

1.18 Alabama Immigration Law:

The Contractor receiving the bid award must abide by the Alabama Immigration Law (also referred to as "Act 2011-535" and codified in State law as Title 31, Chapter 13 of the Code of Alabama 1975) and as it was amended by Act #2012-491 that was signed by Governor Bentley on May 18, 2012.

1.19 Local Bid Preference:

The City of Foley has accepted the local bid preference guidelines established in Act 2015-293 and allows these guidelines to be utilized when appropriate, on a case by case basis. The local preference area has been established per Resolution 15-2369-RES and is defined as the area within the police jurisdiction of the City of Foley. Bid awards may be made to local vendors in this area if their submission is within 5% of a lower bid submitted by a vendor outside of this area and a 10% preference is extended if the lower bidder is located outside the state.

"The City of Foley encourages all vendors to list job openings with Job Services of Alabama."

You may be aware that the Alabama Legislature enacted a new law on immigration during its 2011 Regular Session (Act No. 2011-535). Section 9 of the Act requires that as a condition of an award of a contract with a state or local government entity, the business entity "shall not knowingly employ, hire for employment, or continue to employ an unauthorized alien and shall attest to such, by sworn affidavit signed before a notary." Said affidavit shall also include the entity's Employment Eligibility Verification User Identification Number as evidence of enrollment in the E-Verify program and will continue to participate in the E-Verify program for the entire term of said contact, grant, or incentive it has with the City of Foley.

The City of Foley is required to comply with the provisions of the new Alabama Immigration Law (the Act). Compliance requirements for municipalities in Alabama became effective January 1, 2012. The requirements flow down to all contractors, vendors, and grantees doing business with the City and employing one or more employees. ***To comply with the new Act, the City requires the following information be provided by you prior to award of contract:***

IF YOUR COMPANY HAS ALREADY SUBMITTED AN AFFIDAVIT TO THE CITY OF FOLEY, YOU DO NOT HAVE TO RESUBMIT THIS FORM.

1. PROVIDE your entity/company's information on the enclosed Affidavit of Alabama Immigration Compliance (Affidavit);
2. If you do NOT employ one or more employees, complete Part I of the Affidavit.
3. If you DO employ one or more employees and are required to comply with this new law, complete Part II of the Affidavit.
4. PROVIDE your entity's E-Verify Employment Eligibility Verification User Identification Number in Part II of the Affidavit;
5. If required to comply and not currently enrolled in E-Verify, go to the E-Verify Home Page to initiate enrollment. E-Verify is a program that verifies the employment eligibility of all newly hired employees. http://www.uscis.gov/portal/site/uscis
6. EXECUTE, HAVE NOTARIZED and RETURN the completed Affidavit to the following address:

City of Foley
Attn: Accounts Payable
P.O. Box 1750
Foley, AL 36536

We regret any inconvenience or burden that these new requirements place on you and your business or organization. However, all municipalities in Alabama are mandated to comply with the new Alabama Immigration Law. If you wish to continue doing business with the City of Foley, you must comply and submit a completed Affidavit.

If we can assist in any way, please contact us at 251-943-1545. We appreciate your cooperation regarding this matter.

AFFIDAVIT OF ALABAMA IMMIGRATION COMPLIANCE

The signed Affidavit must be notarized.

In compliance with Sections 31-13-9 of the Alabama Code, this Affidavit of Alabama Immigration Compliance must be completed and signed by an officer or the owner of a business entity or employer and notarized. Please complete Part I if you do NOT employ one or more employees or Part II if you DO employ one or more employees.

Company Name	
Company Representative	*(Please Print Name)*
Address	
City, State, & Zip Code	

PART I – (Complete if you do NOT employ one or more employees and notarize below.)

I certify in my capacity as _____ for the above noted business entity that said entity does not employ one or more employees. I further certify that should my status change and I am required to comply, I will submit all required documents to the City of Foley. I have read this Affidavit and swear and affirm that it is true and correct.

_____
Signature of Affiant

PART II – (Complete if you DO employ one or more employees and notarize below.)

As a condition of the above-referenced Entity/Company's receipt of any contract, grant, or incentive from, by or with the City of Foley, Alabama, the undersigned, as such officer, agent or representative of said Company, after being first duly sworn, states as follows:

1. That said Company will not knowingly employ, hire for employment, or continue to employ an unauthorized alien.
2. That said Company has enrolled in, is currently participating in, and will continue to participate in the "E-Verify" program run by the United States Citizenship and Immigration Service Bureau of the United States Department of Homeland Security for the entire term of said Company's performance under any contract, grant, or incentive it has with the City of Foley, Alabama.
3. The undersigned further represents that, should said entity/company employ or contract with any subcontractor(s) in connection with the physical performance of services pursuant to the contract with the City of Foley, it will secure from such subcontractor(s) verification of compliance with Section 31-13-9 of the Code of Alabama 1975, in a form substantially similar to this affidavit.

Entity's E-Verify Employment Eligibility Verification User Identification Number is: _____

I have read this Affidavit and swear and affirm that it is true and correct.

_____
Signature of Affiant

NOTARY SECTION

State of _____:
County of _____:

Sworn to and subscribed before me this _____ day of _____, 20_____. I certify that the affiant is known (or made known) to me to be the identical party he or she claims to be.

_____
Signature and Seal of Notary Public
My Commission Expires: _____

Please execute, have notarized, and return to the **City of Foley, P.O. Box 1750, Foley, AL 36536**.