INVITATION TO BID AND LEGAL NOTICE

NOTICE IS HEREBY GIVEN that the Board of Trustees of the Village of Altamont, County of Albany, State of New York, invites and will receive sealed bids at the Village Office located at 115 Main Street, PO Box 643, Altamont, NY, at or before the hour of 2:00 PM on July 20, 2017, for the village's purchase of a 2018 Custom Engine/Pumper for the village's fire department. Sealed bids will be received and recorded by the Village Clerk. Any bid received after 2:00 PM on July 20, 2017 will be returned to the point of origin unopened. Bidders assume all risks for timely, properly submitted deliveries. E-mail bid submissions are not acceptable and will not be considered.

Bid packets may be obtained by the following:

- In-person from the Village Clerk's Office during the hours of 9:00AM to 12:00PM and 1:00PM to 4:00PM, Monday through Friday, except holidays and office closure for a fee of $11.00
- Via Regular USPS Mail for a fee of $15.00
- Downloadable PDF from the village's website at www.altamontvillage.org under Custom Engine/Pumper Bid Packet on the home page.

The Village of Altamont reserves the right to reject any and all bids that substantially or materially deviate from the specifications and other required bid documents, and further reserves the right to waive minor irregularities and immaterial variances and formalities in the bids.

Receipt of these bid documents does not indicate that the Village of Altamont has pre-determined your company's qualifications to receive a contract award. Such determination will be made after the bid opening and will be based on our evaluation of your bid submission compared to the specific requirements and qualifications contained in these bid documents.

Failure to denote "Sealed bid on Fire Apparatus" on the bid envelope and/or package will result in the opening of said material and will result in the disqualification of said bid.

All bids will be opened at 2:00 PM on July 20, 2017 in the Village Office located at 115 Main Street, Altamont, NY 12009. All bidders or their authorized agents are invited to be present when the bids are opened and read publicly. All bids may be inspected at this time and thereafter presented to the Village Board of Trustees for their consideration. No bid may be withdrawn after the specified opening time and date. Once opened, all bids become the property of the Village of Altamont, and will not be returned to the bidders.

DATED: 06/22/17

PATTY BLACKWOOD
Village Clerk
Village of Altamont

(06/22)

REQUESTED

BID SPECIFICATIONS

FOR A

2018 CUSTOM

ENGINE / PUMPER

FOR THE

VILLAGE OF ALTAMONT

FIRE DEPARTMENT

Bidder Complies	
Yes	No

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.

These specifications detail the requirements for general design criteria of cab and chassis components, 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 Village of Altamont 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

Bidder Complies	
Yes	No

- 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 and serial number
- Pump transmission make, model, serial number and gear ratio
- Auxiliary pump make, model, rated capacity in gallons per minute and serial number
- Water tank certified capacity in gallons
- 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 apparatus 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 manufacturers' certification of hydrostatic test.

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

If the apparatus has a fixed line voltage power source, the certification of the test for the fixed power source (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.

Bidder Complies	
Yes	No

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 Village of Altamont 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 "Sealed Bid on Fire Apparatus", 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, e-mail 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 Village of Altamont Fire Department that an item bid as "equal to" a particular specified item, is truly of equal quality, design, and function. The Village of Altamont 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.

"TOP OF THE LINE" CHASSIS

Bidders shall propose a custom built chassis, which is "Top of the Line" and includes an integrated multiplexed electrical system. NO EXCEPTIONS!

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 are 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.

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.

PAINT PERFORMANCE CERTIFICATION

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

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 50-mile radius of the Purchaser.

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.

Bidder Complies	
Yes	No

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 bidder's 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.

Bidder Complies	
Yes	No

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.

Delivery Time:_____ Calendar days

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.

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

All bids must have a Certificate of Non-Collusion in accordance with section 103-D of the General Municipal Law. Bids not containing said certificate must be rejected by New York State General Municipal Law 103-d[b].

IRAN DIVESTMENT ACT OF 2012 CERTIFICATION

All bids must have a Certificate of Iran Divestment Act of 2012 in accordance with section 165-a of the State Finance Law and section 103-g of the General Municipal Law. Bids not containing said certificate shall not be considered for award nor shall any award be made where the bidder or proposer fails to submit a signed and verified bidder's certification.

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.

Bidder Complies	
Yes	No

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 a minimum of one (1) factory inspection trip to the apparatus manufacturer's facility. Transportation, meals, lodging, and other requisite expenses shall be the bidder's responsibility.

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

The factory visits will occur at the final inspection stage of production of the apparatus.

The Village of Altamont 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 Village of Altamont Fire Department.

During inspection visits, the Village of Altamont 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.

DELIVERY, DELIVERY ENGINEER, AND TESTING

Delivery of the apparatus to the Village of Altamont Fire Department shall remain the bidder's responsibility.

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

Demonstration and training shall be provided for a minimum of eight (8) hours.

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

VEHICLE 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

VEHICLE INSPECTION

The completed vehicle should include a safety inspection windshield sticker and/or the appropriate certification as required by the state Department of Transportation at time of delivery.

Bidder Complies	
Yes	No

CONTINGENCY FUND

An allowance of $10,000.00 is included in the proposal price to be used by the Village of Altamont Fire Department for future shelving choices. In the event this fund is not utilized completely, the remaining funds shall be credited back to the Village of Altamont Fire Department.

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. (No Exceptions).

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.

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.

Bidder Complies	
Yes	No

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.

BIDDERS AFFIDAVIT

Bidders Name:

Address:

I, _____ as the authorized agent for _____ do hereby swear and affirm that the following information is true and that the proposal that our firm is submitting complies with all the General Instructions, Requirements, and Specifications contained in this Bid Package, except where indicated below.

1. The apparatus offered is manufactured in North America: YES____ NO____
2. The apparatus proposed is not a prototype: YES____ NO____
3. The performance tests shall be performed in compliance with the specifications: YES____NO____
4. All pages of the General Instructions, Requirements, and Specifications have been received and reviewed: YES____ NO____
5. All questionnaires and blanks have been completed and filled in: YES____ NO____
6. Bid Bond is enclosed: YES____ NO____
7. Bidder complies with Specifications without Exception: YES____ NO____
8. Bidder complies with Design Criteria: YES____ NO____
9. Bidder has included Apparatus Drawings per Specifications: YES____ NO____
10. Apparatus proposed complies with dimensional requirements: YES____ NO____
11. Does the Manufacturer provide a program for the familiarization of the fire department: YES____ NO____
12. Are all specified warranties included: YES____ NO____
13. Are all proposed warranties in compliance with specifications: YES____ NO____
14. Body structure covered by a 120 month warranty: YES____ NO____
15. Body sub frame covered by a 120 month warranty: YES____ NO____
16. Cab structure covered by a 120 month warranty: YES____ NO____
17. Paint covered by a 120 month warranty: YES____ NO____
18. Chassis frame rails and cross members covered by a "lifetime" warranty: YES____ NO____
19. Are the proposed apparatus and equipment new in all respects: YES____ NO____

Bidder Complies	
Yes	No

20. Is a complete copy of the bidder's detailed proposal included: YES____ NO____

21. Is a separate sheet of exceptions attached: YES____ NO____

22. Service Ability form completed and attached: YES____ NO____

23. State the dimensions of the proposed apparatus: YES____ NO____

- Overall Height: _____
- Overall Length: _____
- Overall width: _____

24. Is the proposed device proof load tested as required in these specifications: YES____ NO____

25. Is the manufacturer a sole source manufacturer, including the entire; chassis, cab, and body: YES____ NO____

Delivery of the apparatus shall take place within 365 calendar days after the execution and acceptance of a contract.

Manufacturers Name:_____

Address:_____

Contact Person for Questions Regarding Bid:_____

Phone Number: _____Fax Number:_____

Name of Authorized Agent:_____

Signature of Authorized Agent:_____ Date:_____

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. 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 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.

Bidder Complies	
Yes	No

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.

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.

LINE VOLTAGE ELECTRICAL SYSTEM CERTIFICATION

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 the required line voltage section of NFPA.

SERVICE ABILITY FORM

Service Center Location:

Distance in miles (one way) from Local Service Center Location to the Purchaser's Location is: _____ miles.

Please answer the following questions:

Is this shop an authorized warranty center for the apparatus builder? Yes ____ No ____

Is the Service Center enclosed and heated? Yes ____ No ____

Number of full time Service Center Employees: _____

Number of Fire Pump Manufacturers Certified Employees: _____

Number of fully equipped service vans: _____

Is your shop equipped to handle the following repair work:

Cab & Chassis Repairs: Yes ____ No ____
Body Repairs: Yes ____ No ____
Paint Work: Yes ____ No ____
Water Tank Repairs: Yes ____ No ____
Major Pump Repairs: Yes ____ No ____
General Welding: Yes ____ No ____
Frame & Spring Repairs: Yes ____ No ____
Pneumatic Light Tower Repairs: Yes ____ No ____
PTO Generator Repairs: Yes ____ No ____
Power Train Repairs: Yes ____ No ____

This form was completed and submitted by:

_____

(Please print or type full name)

Title of Individual:_____

Signature of individual:_____

SUBSCRIBED AND SWORN before me Notary's Stamp

This ____ day of _____

20__

Notary Public:_____

Commission Expires:_____

GENERAL APPARATUS DESCRIPTION "PUMPER"

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

- Chapter 1 Administration
- Chapter 2 Referenced Publications
- Chapter 3 Definitions
- Chapter 4 General Requirements
- Chapter 5 Pumper Fire Apparatus
- Chapter 12 Chassis and Vehicle Components
- Chapter 13 Low Voltage Electrical Systems and Warning Devices
- Chapter 14 Driving and Crew Areas
- Chapter 15 Body, Compartments and Equipment Mounting
- Chapter 16 Fire Pumps and Associated Equipment
- Chapter 18 Water Tanks
- Chapter 20 Foam Proportioning Systems
- Chapter 22 Line Voltage Electrical Systems
- Chapter 25 Winches

CAB SAFETY SIGNS

The following safety signs will be provided in the cab:

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

CHASSIS DATA LABELS

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

Fluid Data

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

Chassis Data

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

Manufacturers weight certification:

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

ROLLOVER STABILITY

The apparatus will 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 & G.V.W.R.

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.: 21,500 lbs.
- MINIMUM REAR G.A.W.R.: 31,000 lbs.
- MINIMUM TOTAL G.V.W.R.: 52,500 lbs.

SEAT BELT ANCHOR TESTING

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

SEAT MOUNTING TESTING

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

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

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

CAB TYPE

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

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

OPEN SPACE DESIGN

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

CAB MATERIAL - ALUMINUM

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

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

CAB - BASE CONSTRUCTION

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

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

CRASH TESTING CERTIFICATION

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

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

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

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

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

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

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

DIMENSIONS - LONG FOUR DOOR STYLE CAB

Minimum Cab Dimensions:

- Overall width — 100"
- Overall length — 148" (min.)
- Inside width across ceiling — 92"
- Front area floor to ceiling — 62"
- Crew seat area width — 92"

- 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)

Glass Area Dimensions (min.):

- 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 — 91-1/4" high

CAB ROOF

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

The cab roof over the rear crew area will be raised sixteen (16) inches higher than the front driver and officer area. The front face of the raised roof section will be sloped at a 45 degree angle, creating a streamlined interface with the standard, lower, forward roof section. This design will allow for additional interior height in the rear crew area.

The rear crew area doors will be "full length" doors, extending full height to the radius edge of the raised roof.

Approximate dimensions:

- Crew area floor to ceiling — 70"
- Top of crew seat to ceiling — 52" (depending upon seat type)

CAB ROOF DRIP RAIL

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

STEPWELL BATTERY ACCESS DOOR

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

CAB DOORS

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

The forward cab door opening will be a minimum of 40" wide, and the rear cab door opening will be a minimum of 37" wide. The rearward cab doors will 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 will be a heavy duty piano type stainless steel hinge on each door with a minimum pin diameter of 5/16". Hinges will be slotted for ease of horizontal and vertical adjustment. There will be a cab door seal and the doors will close flush with the side of the cab. A heavy-duty 6" wide belting material will be utilized to prevent the cab doors from opening greater than 90 degrees.

ENTRY STEP AREA

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

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

DOOR LATCHES

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

LOCKING CAB DOORS

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

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

DOOR WINDOWS

Each side cab door will have a tinted retractable window operated by a hand crank mechanism. The window track will be designed into the door frame extrusion, which will be extruded with a track groove to house a window track and seal.

DOOR WINDOW TRIM

Each side cab door window will be designed with a custom extruded trim plate, which will conform to the perimeter of the window opening in each door. The trim plate will extend from the edge of the door skin to the window and will have a silver anodized finish.

INNER DOOR PANELS

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

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

CAB DOOR EDGE MARKINGS

The outer edge of each cab door frame will be equipped with a 1" wide x full height white reflective Scotchlite stripe.

EXTERIOR CAB WALL OVERLAY

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

TRANSVERSE CAB COMPARTMENTS

Two (2) compartments will be provided, to the rear of the crew cab doors. These compartments will be approximately 38" high, 10" wide and 25 3/4" deep in the lower area and transverse in the area above the frame rails. The transverse portion of the compartment will be approximately 10" wide x 18" high. The transverse section will be designed to be capable of being utilized for a seat riser. To make the compartment accessible from inside the crew area, the front wall of the transverse section will be equipped with two (2) drop down flat panel doors.

The exposed section of the compartment in the rear crew area will be painted with a textured paint to match the cab interior. The interior of the compartment will be painted to match the color or material provided in the body compartments.

Compartment door will have a 3/16" aluminum exterior skin door with a one (1) inch box pan and a stainless steel "D" ring handle. Door will be hinged on the forward edge with a stainless steel vertical piano hinge so it opens toward the rear cab door. The door will be held in the open position by a gas shock stay arm.

Each compartment will contain a light for illumination of the compartment and will be wired to a door jamb switch to automatically come on when the door is opened. The light will be the same style that is used in the body compartments.

WINDSHIELD/GLASS

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

WINDSHIELD WIPERS AND WASHER

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

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

Windshield washers will be electric operated wet-arm type with a 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 will be integral with the intermittent wiper control switch.

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

WINDSHIELD WIPER DURABILITY CERTIFICATION

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

CAB SIDE VIEWING WINDOWS

A fixed, tinted window with 620 sq. in of glass area will 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.

GRAB HANDLES

Four (4) 1-1/4" diameter x 28" long, knurled bright anodized aluminum handrails will be provided, one (1) at each cab door entrance. Grab rail stanchions will be chrome plated and offset when necessary to prevent "hand-pinching" when opening or closing the doors. Formed rubber gaskets will be provided between each stanchion base and the cab surface.

INTERIOR GRAB RAILS

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

- One (1) 11" long, horizontally mounted, on each front cab door on the upper interior door panel
- One (1) 12" long, vertically mounted, on the officer's side "A" post
- One (1) 11" long, horizontally mounted, on each rear cab door on the interior door panel
- One (1) 30" long, horizontally mounted, on each rear cab door, located approximately 8" above the bottom of the window opening
- Three (3) 12" long, vertically mounted, one (1) on the driver's side cab interior on the "A" post and one (1) each side of the cab interior on the "C" post in the crew area

STAINLESS STEEL FRONT CAB GRILL

There will be a mirror finished stainless steel, custom formed grille assembly for maximum air flow to the charge air cooler and the radiator. The grille will be designed with an aesthetic look, with large horizontal louvers that will be reinforced to provide integrity.

The grill will be a modular design to allow the sides or the individual louvers to be replaced if damaged.

An American flag mesh bug screen will be provided behind the front grill assembly to protect the radiator from bugs and other debris. The screen will be secured to the front of the cab by button snaps, behind the main grill.

ENGINE AIR INTAKE SYSTEM

The air inlet will be equipped with dual ember separators for separating burning embers from the air intake system. This system will 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 will 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 will not be acceptable!

CAB WHEEL WELL LINERS

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

CAB FENDERETTES

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

FRONT MUD FLAPS

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

RETRAC MIRRORS, HEATED, REMOTE CONTROLLED W/ INTEGRAL CONVEX

Two (2) Retrac 613305 mirrors will be furnished, one on each front cab door. Each mirror will have a 14-1/2 x 8 flat glass upper head and a 4-1/2 x 8 convex lower head mounted in a one piece chrome plated housing. All heads will be electrically heated. The upper flat glass portion as well as the lower convex section will be electrically controlled from the driver's seating position.

The stainless steel loop mounting bar will be installed on the forward portion of each front door in front of the side windows with an upper and lower mounting bracket.

All wiring shall be enclosed within the mirror framing. No exposed wiring allowed.

MIRROR CONTROL/S

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

INTERIOR TRIM

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

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

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

The interior metal surfaces of the cab will be finish painted with a textured gray paint.

INTERIOR REAR WALL

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

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

UNDER SEAT STORAGE COMPARTMENTS

There will be a compartment provided under each front seat. Each compartment will 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 will be lined with BARYFOL vinyl composite flooring to comply with NFPA noise and heat requirements.

ENGINE ENCLOSURE

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

A padded, hinged access door will be provided in the top rearward portion of the engine enclosure. The door will allow access to the engine oil, transmission fluid, power steering fluid level dipsticks and the windshield washer fluid reservoir. The access door will be provided with two (2) flush mounted latches and gas shock holders. There will 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 will be an integral part of the cab structure, which will be constructed from a minimum of .25" 5052-H32 aluminum. This material will be welded to the floor sub frame on each side of the cab and will extend from the very front of the cab to the rear of the engine enclosure.

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

SUN VISORS

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

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

DRIVERS SEAT

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

lumbar support. The seat will have a five inch fore and aft adjustment, a three inch height adjustment with a reclining seat back. The seat air ride suspension will be pneumatically controlled from a control switch on the forward lower edge of the seat.

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

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

OFFICERS SEAT

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

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

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

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

REAR FACING, OUTBOARD, DRIVER SIDE SEAT

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

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

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

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

REAR FACING, OUTBOARD, OFFICER SIDE SEAT

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

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

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

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

CENTER FORWARD FACING CREW SEATS

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

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

Each seat will 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 will have a flip-up style seat.

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

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

SEAT UPHOLSTERY MATERIAL

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

SEAT BELT CUSHION SENSORS AND BELT SENSORS

The apparatus will be equipped with a Class 1 seat belt warning system. The system will consist of a Seat Belt module and will display the seating positions through the main UltraView screen.

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

VEHICLE DATA RECORDER

A Class 1 Vehicle Data Recorder (VDR) system will be provided. The system will include an NFPA compliant "Black Box" with reporting software that will be capable of data storage to coincide with the NFPA requirements.

Data storage capabilities will include interfaces with the following systems:

- Display module (Master Optical Warning Device)
- VDR, date & time stamp
- Max Vehicle speed (MPH)
- Vehicle acceleration / deceleration (MPH/Sec.)

- Engine Speed (RPM)
- ABS event
- Data password protected
- Data sampled once per second, in 48-hour loop
- Data sampled min by min for 100 engine hours
- Throttle position (% of Throttle)
- Data software
- PC / Mac Compatible
- Data summary reports

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

CAB DOGHOUSE STORAGE MODULE

A storage module will be installed on the center doghouse area between the driver and officer. The module will be constructed of 1/8" aluminum and will be painted with a scuff resistant paint to match the cab interior. The module will include two (2) cup holders, a pen tray, a flat open storage area for notebooks, six (6) divided storage area's for 3-ring binders, and four (4) slide in storage area's two (2) accessible from each side of the cab.

PAC TRAC

Aluminum Pac Trac #7000 channel material for tool and equipment mounting will be provided on the rear cab wall, driver side. Approximate size will be 50" x 18". All installation hardware will be stainless steel.

PAC TRAC

Aluminum Pac Trac #7000 channel material for tool and equipment mounting will be provided on the rear cab wall, officer side. Approximate size will be 50" x 18". All installation hardware will be stainless steel.

ANTENNA INSTALLATION

Three (3) antenna mounting base(s) model #MATM with 17' of coaxial cable will be provided and installed on the lower cab roof, behind the light bar. The attached antenna wire(s) will be run to the right side cab dash area.

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

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

DASH & CENTER CONSOLE

The dash will 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 will be centered in front of the driver and all gauges will be installed in a non glare, pewter finish panel.

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

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

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

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

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

The primary gauges will consist of:

- Vehicle speedometer, (0-80 mph)
- Engine tachometer, (0-3000 rpm)
- Engine oil pressure, (0-100 psi); low oil 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) will 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 1 ULTRAVIEW DISPLAY

An UltraView 700 7" display will be provided on the dash for the electrical Class One ES-Key multiplex system. The exact location will be determined by the totality of instruments and switches on the cab dash.

ADDITIONAL CLASS 1 ULTRAVIEW 700 ON OFFICER SIDE OF CAB

An additional Class 1 UltraView 700 7" display will be recessed mounted on the officer side of the cab. The second display will have the ability to perform and display all the same functions and information of the main display located on the driver side of the cab.

INDICATOR CLUSTER

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

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

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

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

On the Road displays include:

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

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

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

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

- "Right And Left Directional" arrows (green in color)
- "Ignition ON" Indicator (amber in color)
- "Hi Beam" indicator (blue in color)
- "Battery ON" indicator (green in color)

- "Parking Brake ON" indicator (red in color)
- "Check Transmission" indicator (amber in color)
- "Cab Not Latched" indicator (red in color)
- "Stop Engine" indicator (red in color)
- "Check Engine" indicator (amber in color)
- "ABS Warning" indicator (red in color)
- "Low Coolant Level" (red in color)
- "Fuel Restriction" indicator (amber in color)
- "Water In Fuel" indicator (amber in color)
- "Fasten Seat Belts" indicator (red in color)
- "Fast Idle" Indicator (amber in color)
- "Do Not Move Truck" indicator (red in color)
- "DPF Regeneration" (amber in color)
- "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 will be capable of housing five (5) guarded type rocker switches. Examples of the switches that will 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 will be mounted in the driver's lower left panel.

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

MOBILE TERMINAL AREA

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

Bidder Complies	
Yes	No

HEATER/DEFROSTER AND AIR CONDITIONING SYSTEM - VISTA

System will be a dual roof mounted SGM air conditioning system capable of cooling a heat soaked cab interior temperature of 100°F down to 73°F in 30 minutes with an outside ambient air temperature of 100°F and 50% humidity.

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

Air conditioning hoses and fittings will be appropriately sized to the compressor and other specified air conditioning components. Minimum hose size, will be #10 hose for discharge and #12 hose for suction. Steel hose end fittings will be provided at the compressor. The air conditioner hose will be the Aeroquip "Easy Clip" style hoses as recommended by Aeroquip. The A/C hoses will 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 will be provided on the cab roof. Both the front and rear overhead units will include the heating units. (if applicable, the raised roof will be equipped with notch to accommodate the condenser unit)

Two (2) evaporators, with a minimum blower output of 720 CFM through the louvers will be provided. Both evaporator units will be mounted on the cab roof, enclosed by aluminum panels painted white. The evaporator louvers and controls will penetrate the cab roof into occupant compartments to the least extent practicable. Fourteen (14) 3" diameter adjustable louvers will 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 will 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 will be roof mounted to allow service and maintenance without the need to remove interior components or upholstery.

System will be compatible with R134A refrigerant.

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

The controls system will 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 will be configured to only operate when the vehicle's engine is running.

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

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

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

A serviceable foam intake filter will 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.

ROOF MOUNT CONDENSER

A 12-volt roof top dual condenser will be strategically positioned on the cab roof so as not to interfere with any emergency lighting systems. The condenser will 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 will include rifled tubing for maximum efficiency. Each coil will be painted black. The condenser unit must include a receiver drier with a high and low pressure switch. The wire harness will include necessary wiring for the clutch circuit as well as a separate power relay circuit.

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

CLIMATE CONTROL SWITCHES

The multiplex system control screen will contain all controls for the cab HVAC system. The following controls will 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 will be provided, consisting of an electric-powered hydraulic pump, fluid reservoir, dual lift cylinders, remote cab lift controls and all necessary hoses and valves.

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

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

The two (2) rear outboard cab latches will be of the hydraulic pressure release, automatic re-latching type, and provide an automatic positive lock when the cab is lowered. The latch will 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 will not exceed 550 PSI. The latch will 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 will be electric over hydraulic type, with a pressure rating of not less than 4,000 PSI. Additionally, the cab tilt device will be both electrically and hydraulically interlocked to prevent inadvertent activation of the cab tilt system.

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

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

CHASSIS FRAME ASSEMBLY

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

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

Each main frame rail will be 10-1/4" x 4" x 3/8", fabricated from Domex™ 110,000 PSI minimum yield steel, with a minimum section modulus of 18.396 cu in and a resisting bending moment (RBM) of 2,023,560 inch pounds. The frame rails will 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" will be installed. Total section modulus of each rail, with liner, will be 33.56 cu in and the total resisting bending moment (RBM) will be a minimum of 3,691,050 in-lbs, per rail.

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

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

FRONT BUMPER

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

BUMPER EXTENSION

The bumper will be extended 27" with a polished aluminum tread plate gravel shield enclosing the top and ends.

WINCH RECEIVER POINT- FRONT OF CHASSIS

A 2" square receiver point will be provided below the front bumper for a portable winch. The receiver pointwill be a 2 1/2" x 2 1/2" x 1/4" seamless steel tube welded and gusseted to 3" x 1 1/2" steel channel directly bolted to the chassis frame rails. A 12v electrical connection with a quick disconnect compatible with the port-able winch will be provided adjacent to the receiver point. A plastic end cap will be provided for the quick disconnect.

STORAGE WELL - CENTER

One (1) storage well constructed of 1/8" aluminum shall be installed in the gravel shield. This storage well shall be designed to be notched in the chassis frame rails to match GSO 8565. The bottom of the storage well shall have a minimum of four (4) drain holes.

The center storage well will be equipped with Turtle Tile material to provide drainage and ventilation of equipment in storage well.

CENTER WELL - GENERAL STORAGE

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

STORAGE COVER, FULL WIDTH

A raised tread plate cover will be provided over the full width of the front bumper between the front suction and Q-siren. The cover will be hinged at the bottom rear and will be held in the open position with two (2) gas shock stay arms. The cover will be secured in the closed position with two (2) rubber hold down clamps. Two (2) chrome "D" grab handles will be located on the front face for assisting in opening/closing of the cover.

One (1) Amdor Luma Bar LED strip light will be mounted to the underside of the lid and wired to a magnetic door switch for auto ON/OFF when the cover is opened.

FRONT TOW HOOKS

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

BUMPER GUIDE RODS

Lighted LED bumper guide rods will be mounted on the front bumper ends. The guide rods will allow the driver to gauge the clearance between the front bumper and potential obstacles. The parking lights will activate the guide pole lights.

FRONT AXLE

The front axle will be rated at 21,500 lbs.

FRONT DISC BRAKES

17" disc brakes will be provided for the front axle. The front brakes will be full air actuated with automatic slack adjustment.

FRONT SUSPENSION

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

The front leaf springs will have a minimum of 10 leaves, a minimum length of 51", and a minimum width of 3-1/2". The capacity at ground will be 21,500 lbs. All springs will be of center bolt design. All spring pins will be positively restrained from rotating in brackets and shackles.

FRONT SHOCK ABSORBERS

The front suspension system will 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 will be a single axle with a capacity of 31,000 lbs. (Minimum). Axle will be a single reduction axle with hypoid gearing and oil-lubricated wheels bearing. Oil seals will be provided as standard equipment.

REAR BRAKES

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

REAR AXLE TOP SPEED

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

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

TIRE CHAINS

The vehicles rear drive axle will be equipped with an On-Spot 6 strand tire chain system. The system will utilize the existing vehicle air compressor system. A switch will be provided in the drivers console area to control the activation of the chains. The switch will have a safety feature, which does not allow for inadvertent activation.

REAR SUSPENSION

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

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

REAR SHOCK ABSORBERS

The rear suspension system will be equipped with Monroe, model "Magnum" model #74001, double acting hydraulic shock absorbers. Shock absorbers to have a minimum bore of 1.38" and an outside diameter of approximately 3-1/4".

***** 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 will be installed. It will be direct air type with dual air treadle in the cab. The system will be powered by an engine mounted, gear driven air compressor protected by a heated air dryer.

The air system will 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 will be plumbed with stainless steel braided hose lines with a Teflon lining. Eaton Synflex Eclipse Air Brake tubing will be run along the inside frame rails and connected with push to connect type fittings that meet or exceed all industry standards. All Synflex will be secured with non-conductive, corrosion resistant strapping mounted with standoff fasteners.

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

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

Bidder Complies	
Yes	No

ABS SYSTEM

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

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

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

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

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

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

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

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

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

AIR DRYER SYSTEM

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

Bidder Complies	
Yes	No

AIR LINES

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

AIR COMPRESSOR

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

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

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

BRAKE TREADLE VALVE

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

PARKING BRAKE

Parking brake will be of the spring-actuated type, mounted on the rear axle brake chambers. The parking brake control will be mounted on the cab center instrument panel, offset toward the driver. A red indicator light will be provided in the driver dash panel that will illuminate when the parking brake is applied.

FRONT WHEELS & TIRES

The front wheels will be 22.5" x 13" ten stud, hub piloted polished aluminum disc type.

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

The front tires will be Goodyear 425/65R22.5 "20 Ply" tubeless radial G296 MSA on/off road tread. The tires will be fire service rated up to 24,400 lbs and will have a top speed of 68 mph when inflated to 120 psi.

Fire Service Rating defined as no more than 50 miles of continuous operation at maximum load, or without stopping for at least 20 minutes. Emergency vehicle will reduce its speed to no more than 50 mph after the first 50 miles of travel.

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 will be 22.5" x 9" ten stud, hub piloted polished aluminum disc type.

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

The rear tires will be Goodyear 315/80R22.5 "18 Ply" tubeless radial RHD II+ traction tread. The tires will be fire service rated up to 32,000 lbs and will have a top speed of 75 mph when inflated to 125 psi.

Fire Service Rating defined as no more than 50 miles of continuous operation at maximum load, or without stopping for at least 20 minutes. Emergency vehicle will reduce its speed to no more than 50 mph after the first 50 miles of travel.

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

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

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

ENGINE

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

A fuel/water separator will be provided.

ENGINE CHASSIS CERTIFICATION

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

COOLING/RADIATOR

Radiator will be brass with bolted steel top and bottom tanks. The cooling system will be designed for a maximum of fifteen (15) PSI operation. There will be a sight glass in the radiator to check the coolant level without removing the radiator cap. The core construction will be tube and fin with three (3) tube rows, 273 total core tubes, and fourteen (14) fins per inch.

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

Core area to be a minimum of 1375 square inches (39 H x 35.25W).

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

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

TRANSMISSION COOLER

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

RADIATOR CROSSMEMBER

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

CHARGE AIR COOLER

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

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

Where applicable, the charge air cooler pipes will 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, will be made using high temperature silicone hoses rated for use in temperature up to 500°F, and heavy duty constant tension T-Bolt spring hose clamps. These connections will adequately allow for movement of the engine relative to the charged air cooler.

COOLING SYSTEM FAN

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

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

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

COOLANT HOSE AND PIPING

All coolant piping will 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 will 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 will be minimal in number to reduce the number potential leak points, and will

adequately allow for movement of the engine relative to chassis mounted components. All integral hoses supplied with the engine will be as supplied by the engine manufacturer.

HEATER HOSES

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

ENGINE BRAKE

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

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

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

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

ENGINE FAST IDLE

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

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

AIR CLEANER

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

No part of the air inlet shall be below the frame rails, preventing any type of water intake.

SPARK ARRESTOR

A spark arrestor will be installed in the chassis air intake system. This arrestor will 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 will be installed on the floor in front of the driver. The pedal will be positioned for comfort with ample space for fire boots and adequate clearance from the brake pedal control.

REMOTE THROTTLE CONTROL HARNESS

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

An apparatus interface wiring harness will also be included which will be wired to the cab harness interface connectors and will incorporate circuits with relays to control pump functions. This harness will control the inputs for the transmission lock up circuits, governor/hand throttle controls and dash display which will incorporate "Pump Engaged" and "OK to Pump" indicator lights. The harness will 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 will 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 will be provided. Transmission specifications will 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 will be in accordance with the transmission manufacturer's specification. The transmission will be readily and easily removable for repairs or replacement.

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

The transmission will be calibrated for six (6) forward gears and one (1) reverse gear. Each gear will have the following ratios:

- First 3.49:1
- Second 1.86:1
- Third 1.41:1
- Fourth 1.00:1
- Fifth 0.75:1
- Sixth 0.65:1
- Reverse -5.03:1

TRANSMISSION SHIFT SELECTOR

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

TRANSMISSION OIL LEVEL SENSOR

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

PARK TO NEUTRAL

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

PRESELECT PROGRAMMING

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

The transmission will be programmed at the factory to automatically downshift to 2nd gear.

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

TRANSMISSION FLUID

TES-389 transmission fluid will be utilized to fill the 3000 EVS transmission.

DRIVE LINES

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

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

DIESEL EXHAUST FLUID TANK

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

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

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

EXHAUST SYSTEM

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

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

Exhaust tubing will be a minimum of 16 gauge stainless steel from the turbocharger on the engine to the inlet of the diesel particulate filter. Any flexible exhaust tubing will be HDT stainless steel type. To minimize heat build-up, exhaust tubing within the engine compartment will be wrapped with

an insulating material. Exhaust will be wrapped from the turbocharger to the entrance of the muffler. Material will be held in place with worm gear type clamps.

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

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

SELECTIVE CATALYTIC REDUCTION (SCR)

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

The SCR system will reduce levels of NOx (oxides of nitrogen emitted from engines) by injecting small quantities of diesel exhaust fluid (DEF) into the exhaust upstream of a catalyst, where it vaporizes and decomposes to form ammonia and carbon dioxide. 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 will be constructed from 16-gauge aluminized steel tubing. The exhaust discharge will be on the officer side of the apparatus forward of the rear axle.

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

FUEL TANK

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

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

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

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

FUEL TANK STRAPS

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

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

All fuel lines will be provided as recommended by the engine manufacturer. The lines will be sized to meet engine manufacture's requirements, and will be carefully routed and secured along the inside of the frame rails.

FUEL FILTER/WATER SEPARATOR

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

SECONDARY ELECTRIC FUEL PUMP

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

FUEL POCKET

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

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

DUAL POWER STEERING

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

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

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

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

STEERING COLUMN

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

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

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

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

STEERING WHEEL

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

ROAD SAFETY KIT

A road safety kit will 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 will be GXL cross link insulated type. Wiring is to be color coded and include function codes every three (3) inches on both sides. Wiring harnesses will be routed in protective, heat resistant loom, securely and neatly installed. Two (2) power distribution centers will be provided in central locations for greater accessibility. The power distribution centers will contain thermal automatic reset breakers, power control relays, flashers, diode modules, daytime driving light module, and engine and transmission data links. All breakers and relays will have a capacity substantially greater than the expected load on the related circuit, thus ensuring long component life. Power distribution centers will be composed of a system of interlocking plastic modules for ease in custom construction.

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

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

WIRING HARNESS DESCRIPTION

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

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

All circuits will conform to 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 will be mounted to the following areas; frame to cab, frame to body and frame to pump enclosure.

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

12 VOLT ELECTRICAL SYSTEM TESTING

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

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

TEST #1-RESERVE CAPACITY TEST

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

TEST #2-ALTERNATOR PERFORMANCE TEST AT IDLE

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

TEST #3-ALTERNATOR PERFORMANCE TEST AT FULL LOAD

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

LOW VOLTAGE ALARM TEST

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

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

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

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

ELECTRICAL MANAGEMENT SYSTEM

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

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

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

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

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

A Class1 UltraView # UV700 7" color transmissive TFT display for monitoring critical apparatus and engine information will be provided an installed. The displays will be CAN based utilizing J1939 message protocol. The display will utilize a bonded LCD display screen for optimal visibility in direct sunlight.

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

ADDITIONAL CLASS-1 ULTAVIEW 700 DISPLAY ON OFFICER SIDE OF CAB

An additional Class 1 UltraView 700 display will be provided and installed on the officer side of the cab. The second display will have the ability to perform and display all the same functions and information of the main display located on the driver side of the cab.

CLASS ONE REAR VISION CAMERA

A camera kit shall be provided and installed at the rear of the apparatus. The video output from the camera shall be displayed on the Ultraview display panel.

INTERLOCK INTERFACE MODULE

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

The control screen will be equipped with a Weldon model 0J50-1505-01 swivel mount that will allow the screen unit to be turned 180 degrees toward the officer or the driver.

CHASSIS DIAGNOSTICS SYSTEM

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

The diagnostic system will include the following:

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

VOLTAGE MONITOR SYSTEM

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

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

INDICATOR LIGHT AND ALARM PROVE-OUT SYSTEM

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

12 VOLT SEQUENCER

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

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

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

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

ELECTRICAL HARNESS REQUIREMENT

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

- SAE J 1128 - Low tension primary cable
- SAE J 1292 - Automobile, truck, truck-tractor, trailer and motor coach wiring

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

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

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

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

BATTERY CABLE INSTALLATION

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

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

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

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

ALTERNATOR

There will be a Delco Remy Model 40SI, 320 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 will be designed to provide maximum output at engine idle speed, by using "Remote Sense" in order to meet the minimum continuous electrical load of the apparatus as required.

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

BATTERY SYSTEM

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

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

BATTERY STORAGE

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

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

BATTERY BOX COVER

The battery box will be overlaid with an "L" shaped, polished aluminum tread plate cover. This cover will protect the batteries from road spray, snow and road debris. The cover of this box will be easily removable for inspection, testing and maintenance of the batteries.

BATTERY DISCONNECT SWITCH

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

BATTERY JUMPER STUDS

A set of Cole Hersee battery jumper studs, model #46210-02 (red) and #46210-03 (black) will be provided to allow the battery system to be jump started or charged from an external source. The studs will be located on the bottom of the battery box on the driver's side of the chassis. Each stud will 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 will be provided for the on board, 110 volt battery charging systems.

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

SHORELINE POWER INLET PLATE

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

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

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

The shoreline receptacle will be located in the area directly adjacent to the driver's side cab door.

BATTERY CHARGER / AIR COMPRESSOR SYSTEM

A Kussmaul model # 52-21-1100, "Pump Plus 1200" air compressor/high output battery charger will be provided for maintaining the vehicle's air / battery system. Unique electronic sensing circuits sense the true battery voltage while eliminating the need for external sense wires. Output current will be 40 amperes @ 12 volt DC.

The air compressor will maintain the air pressure in the chassis air brake system while the vehicle is not in use. The air compressor will have a rated input at 12 volt DC @ 12 amps and a max output of 100psi.

An LED bar graph display will be located near the shoreline connection to monitor the battery status.

OPTIONAL DELUXE STATUS CENTER

A Kussmaul #091-194-IND deluxe status center with displays for battery condition, voltage, amperes and output current will be installed adjacent to the 120 volt shoreline connection.

TRANSFER SWITCH

An automatic power relay will be installed to allow interior 120 volt accessories to be powered by the 120 volt shoreline or the generator. The interior accessories to be powered by the shoreline will be wired through a separate sub-panel breaker box. This will allow for a continuous power supply to the interior accessories while the apparatus is parked in the station. The maximum load for the transfer / relay will be 20 amps at 120 volts.

EMERGENCY/AUXILIARY SWITCHES

Switching for the emergency and auxiliary systems will be performed through the multiplex control screen. Switching will be programmed through various menus that are accessible from the display buttons.

"LED" CAB INTERIOR LIGHTING

Four (4) Whelen # 60CREGCS, 6" round, interior LED combination red/white dome lights will be furnished in the cab, two (2) in the forward section and two (2) in the rear crew section. Each dome light will have individual switches to control the red or white LEDs. Each dome light will also activate when the respective, adjacent cab door is opened.

INNER CAB DOOR LED FLASHERS

One (1) Weldon 16" LED door warning lamp will be provided on the inside door panel of each cab door. The light will be mounted on the door's lower scuff plate and will be activated when the respective door is opened. Each light will be furnished with a clear lens and amber led's.

"DO NOT MOVE APPARATUS" WARNING LIGHT

A 1" round, red flashing warning light with an integral audible alarm will 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 will be activated through the parking brake switch to signal when the parking brake is released. This light will be labeled "DO NOT MOVE TRUCK".

12 VOLT POWER PORT NEAR OFFICER

One (1) 12 volt power port accessory outlet(s) will be installed in the cab of the truck for the fire departments accessory devices. The port(s) will be located as directed near the officer's seating position for devices such as cellular phones.

USB CHARGING PORT NEAR OFFICER

One (1) Kussmaul USB charging port(s) will be installed in the cab of the truck for the fire departments accessory devices. Each port will have two (2) USB connections and will have a 5 volt, 4.2 amp max output. The port(s) will be located as directed near the officer's seating position for devices such as cellular phones.

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 will be provided in the cab dash. The circuit will be for future installation of radios or accessories.

12 VOLT ACCESSORY CIRCUIT - CREW CAB AREA

A dedicated 12 volt power and ground circuit will be provided in the rear crew area as required. The circuit will 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, will be installed behind the officers 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 multi-use power point with built in two (2) usb ports, and two (2) 12 volt sockets will be installed in the rear of the cab on the back of the engine enclosure. This will be cabable of up supplying the USB ports with up to three (3) amps and have a 15 amp fuse for overall protection.

HEADLIGHTS CLUSTER

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

HEADLIGHT POSTION

To minimize glare from the headlights on the front bumper storage well cover, the headlights will be mounted in the upper position on the front of the cab. The front warning lights and turn signal lights will be located in lower position.

HEADLIGHT BUTTON PROGRAMMING

The chassis head lights will be programmed so the multiplexed switch defaults to the "ON" state whenever the chassis batteries are turned on. This option includes both the headlight and the marker light switching.

UPPER LIGHT MODULE

Two (2) Code 3 4612*BZ-75 PriZm II LED light heads will be provided, one (1) in each side dual light module, above the headlights, in matching chrome plated bezels.

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

An individual control switch will be provided on the cab switch console, which will be wired through the load management system to prevent excessive amperage draw.

The lights noted above will be provided in addition to the NFPA required, minimum optical warning light package.

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

ARROW TURN SIGNALS

Two (2) Code 3 65STBZA arrow shaped, amber LED turn signals will be provided in chrome plated housings, mounted one (1) each side between the windshield and the dual light modules.

DOT MARKER LIGHTS AND REFLECTORS

The Five (5) DOT approved Light Emitting Diode (LED) cab marker lamps will be included in the HiViz FireTech LED brow light.

Optronics Model MCL48 amber LED marker lights with chrome bezel will 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 will be provided at the lower side rear, one (1) each side.

Optronics Model #STL71AMB yellow LED side marker and turn lights will 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 will 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 will be red in color.

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

Truck-Lite # 98034Y yellow reflectors will 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 will be provided above the mounting position of the license plate. The light will be clear in color and will have a chrome finish.

TAIL, STOP, TURN AND BACK-UP LIGHTS

Two (2) Code 3, 65STR 4" x 6", red LED combination tail and stop lights, will be mounted one each side at the rear of the body.

Two (2) Code 3, 65STA 4" x 6", amber LED arrow turn signal lights, will be mounted one each side, on a vertical plane with the tail/stop lights.

Two (2) Code 3, 65RV 4" x 6", white LED backup lights, will be mounted one each side, on a vertical plane with the turn/tail/stop signals. These lights will activate when the transmission is placed in reverse gear.

Two (2) Code 3 65STK4 mounting flanges, installed one (1) on each side, will be provided to mount the lights described above in one common mounting flange. The fourth opening will be for the lower rear warning lights.

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

CAB STEP LIGHTS

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

all chassis access steps and walkway areas and will include a mounting gasket to provide a watertight seal.

BODY STEP LIGHTS

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

DUNNAGE AREA LIGHTING

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

HOSE BED LIGHTS

Two (2) Amdor LED strip surface mounted lights will be mounted in the hose bed on the side walls to illuminate the hose bed area.

HOSEBED WORKLIGHT SWITCH- RECESSED

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

HOSE BED WORK LIGHT - SWITCH

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

SCENE LIGHTS - BEHIND FRONT CAB DOORS

Two (2) Fire Research Spectra 900 LED scene lights will be provided, one on each side of the cab, directly behind the front cab entrance door in a chrome plated flange. Each light will be 9" wide by 6 ¾" high by 1 ¾" deep, draw 6 amps, and produce 7,000 lumens. The scene lights will be wired through the load management system.

SCENE LIGHTS - REAR OF BODY

Two (2) Fire Research Spectra 900 LED scene lights will be provided, one on each side of the rear body panel in a chrome plated flange. Each light will be 9" wide by 6 ¾" high by 1 ¾" deep, draw 6 amps, and produce 7,000 lumens. The scene lights will be wired through the load management system.

CAB DOOR LIGHT SWITCHING - CAB

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

REAR OF BODY LIGHT SWITCHING - CAB

A switch will be provided in the cab warning light switch console to turn the rear 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 will 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 will 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) Amdor Luma Bar H2O LED 20" ground light will be provided under each side cab door entrance step, four (4) total. The ground lights will turn on automatically with each respective door jamb switch and also by a master ground light switch in the warning light switch console.

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

GROUND LIGHTS - PUMP PANEL

One (1) Amdor Luma Bar H2O LED 20" ground light will be provided under each side pump panel running board, two (2). The ground lights will be activated by a master ground light switch in the cab and will be wired through the load management system.

GROUND LIGHTS - REAR

One (1) Amdor Luma Bar H2O LED 20" ground light will be provided under each rear body corner, two (2) total. The ground lights will be activated by a master ground light switch in the cab and will be wired through the load management system.

GROUND LIGHT SWITCHING

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

GROUND LIGHT SWITCHING

The cab and body ground lights will be equipped with an activation switch in the cab.

LED BROW LIGHT - ABOVE WINDSHIELD

One (1) HiViz LEDs "FireTech" Scene light model FT-B-72-ML-W will be provided. The light instrument will be low in profile with a mounting bracket allowing installation at the top edge of the windshield. The housing will be made of a extruded 6061 aluminum; 72" wide and less than 3" tall.

The scene light will have 57 LEDs divided amongst 3 independent circuits; circuit one featuring 9x 5w LEDs passing light through a 10 degree optic, circuit two featuring 18x 5w LEDs passing light through a 25-40 degree "flood" range, and circuit three featuring 30x 5w LEDs passing light through a 60-90 degree "scene" optic. Circuit four will consist of 5 amber colored diodes that act as SAE-J2042 compliant clearance marker and identification lamps.

The circuitry will feature a PWM LED driver with an onboard electronic thermal manager. Additionally, the bar will meet CISPR25 EMI requirements. The light will operate on 12v DC, generate 28,101 lumens and draw 24 amps.

The light will be adjustable vertically up to 15 degrees. Mounting will be possible in any direction while still meeting NFPA 1901 compliance requirements. The housing color will be White.

LIGHT ABOVE WINDSHIELD SWITCHING - CAB

Three (3) switches will be provided in the cab warning light switch console to control the individual lighting circuits of the HiViz FireTech LED brow light.

**** BODY ELECTRICAL SYSTEM ****

12 VOLT BODY ELECTRICAL SYSTEM

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

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

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

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

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

POWER DISTRIBUTION MODULES

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

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

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

PUMP ENCLOSURE WORK LIGHTS

Two (2) Tecniq model #E18 lights will be provided inside the pump enclosure providing 800 lumens each. Each light will have their own independent switch incorporated into the light head.

ENGINE COMPARTMENT WORK LIGHTS

Two (2) Tecniq model #E18 LED lights will be provided inside the engine enclosure that will provide 800 lumens each. Each light will have their own independent switch incorporated into the light head.

AMDOR LUMA BAR COMPARTMENT LIGHTS - LED

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

Lights will be activated by the opening of the compartment door.

DRIVER SIDE ROOF COMPARTMENT LIGHTING

One (1) Amdor Luma Bar LED strip compartment light(s) will be provided, to ensure proper compartment illumination. The lights will be mounted underneath the roof compartment door opening and will be activated with a magnetic door switch that will be connected to the door ajar warning circuit.

SURFACE MOUNTED 155W SPECTRA LED FLOODLIGHTS – DRIVER SIDE

Two (2) Fire Research Spectra LED model SPA260-Q15 surface mounted lights will be installed, one rearward and one forward on the driver side of the body.

Each lamp head will have sixty (60) ultra-bright white LEDs, 56 for flood lighting and 4 to provide a spot light beam pattern and will operate at 12 volts DC, draw 13 amps, and generate 15,000 lumens of light. Each lamp head will have a unique lens that directs flood lighting onto the work area and focuses the spot light beam into the distance. The LED scene lights will be for fire service use.

SURFACE MOUNTED 155W SPECTRA LED FLOODLIGHTS – OFFICER SIDE

Two (2) Fire Research Spectra LED model SPA260-Q15 surface mounted lights will be installed, one rearward and one forward on the officer side of the body.

Each lamp head will have sixty (60) ultra-bright white LEDs, 56 for flood lighting and 4 to provide a spot light beam pattern and will operate at 12 volts DC, draw 13 amps, and generate 15,000 lumens of light. Each lamp head will have a unique lens that directs flood lighting onto the work area and focuses the spot light beam into the distance. The LED scene lights will be for fire service use.

OFFICER SIDE OF BODY LIGHT SWITCHING - CAB

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

DRIVER SIDE OF BODY LIGHT SWITCHING - CAB

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

NFPA AUDIBLE AND LIGHTING WARNING PACKAGE

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

LIGHT PACKAGE ACTUATION CONTROLS

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

WARNING LIGHT FLASH PATTERN

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

UPPER LEVEL LIGHTING - CODE 3

NFPA ZONE A, UPPER

A Code 3 DF94ANFPA1 "Defender Tri-Core Series", 94" LED cab roof warning light bar will be furnished and rigidly mounted on top of the cab roof.

The light bar will be equipped with the following:

- Clear Lenses with a Black Top
- Ten Forward Facing Red - TriCore 6 LED Red Modules
- Four Forward Facing White - TriCore 6 LED White Modules
- Four Corners – TriCore 6 LED Red Modules

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

NFPA ZONE C, UPPER

Two (2) Code 3 798*BZ-75, PriZm II LED lights, will be furnished and mounted one (1) each side at the rear, upper portion of the apparatus.

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

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

NFPA ZONES B & D REAR, UPPER

Two (2) surface mounted Code 3 7912*BZ-75 PriZm II LED light heads will be furnished and will be 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 will be equipped with red LEDs and a colored lens.

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

NFPA ZONES B & D FRONT, UPPER

Two (2) surface mounted Code 3 7912*BZ-75 PriZm II LED light heads will be furnished and mounted; one (1) each side on the upper side face, towards the front of the body, facing to each side of the unit.

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

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

LOWER LEVEL LIGHTING - CODE 3

NFPA ZONE A, LOWER

Two (2) Code 3 4612*BZ-75 PriZm II LED light heads will be provided and installed one (1) each side.

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

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

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

NFPA ZONE C, LOWER

Two (2) Code 3 65BZ* LED light heads will be provided and installed; one (1) each side directly below the DOT stop, tail, turn and backup lights.

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

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

NFPA ZONES B & D FRONT, LOWER

Two (2) Code 3 4612*BZ-75 PriZm II LED light heads will be provided and installed one (1) each side.

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

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

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

NFPA ZONES B & D MIDSHIP, LOWER

Two (2) Code 3 4612*BZ-75 PriZm II LED light heads will be provided and installed one (1) each side.

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

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

NFPA ZONES B & D REAR, LOWER

Two (2) Code 3 4612*BZ-75 PriZm II LED light heads will be provided and installed one (1) each side.

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

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

WARNING LIGHT SYSTEM CERTIFICATION

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

The warning light system(s) will 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" will be provided with the completed apparatus.

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

ALTERNATING FLASHING HEADLIGHT SYSTEM

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

ARROW STICK WARNING LIGHT

One (1) Code 3 LEDX, "Narrow Stik" Model #NASL847, 47" rear directional light will be installed on the rear of the body. The light will be equipped with eight (8) lamps. The light will be controlled from the cab. The control module will be conveniently located near the driver's position. The rear directional light will be wired through the load management system of the unit.

TRAFFIC ADVISOR - RECESSED IN REAR INTERMEDIATE STEP

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

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

ELECTRIC HORN

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

A three (3) position rocker switch will be installed on the cab dash to activate from the steering wheel horn button one of the following: DOT horn, air horn, or electronic/mechanical siren.

BACK-UP ALARM

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

AIR HORNS

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

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

The air horn(s) will be controlled by dual ceiling mounted lanyard cables, located in the center of the cab.

ELECTRONIC SIREN AND SPEAKER

One (1) Whelen # 295HFS2, 200 watt electronic siren will 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 will meet the NFPA required SAE certification to ensure compatibility between the siren and speaker.

Two (2) Whelen, model # SP123BMC with chrome plated ABS outer flange, siren speakers will be provided, recessed in the front bumper and wired to the electronic siren.

FEDERAL Q2B MECHANICAL SIREN

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

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

Two (2) floor mounted foot switches will be provided, one (1) for the officer and one (1) for the driver. A siren brake button will be provided near the driver's position.

A rocker switch will be installed in the dash panel to allow control of either the air horn or the siren from the steering wheel horn button.

WEATHER BAND AM/FM/CD RADIO

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

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

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

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

PUMP

- **WATEROUS S100-150**
- **1500 G.P.M.**
- **Single Stage**

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

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

PUMP ASSEMBLY

The pump will be of a size and design to mount on the chassis rails of commercial and custom truck chassis, and have the capacity of 1500 gallons per minute (U.S. GPM), NFPA-1901 rated performance.

IMPELLER SHAFT

The impeller shaft will be stainless steel, accurately ground to size, and supported at the drive end by oil or grease lubricated, anti-friction bearings for rigid and precise support. Bearings will be protected from water and sediment by suitable stuffing boxes, finger rings and oil seals. The impeller shaft will be of two-piece construction separable between the pump and pump transmission to allow true separation of the transmission from the pump without disassembly of either component. No sleeve type bearings will be used.

PUMP IMPELLER

The impeller will 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 will 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 will be bronze, and will be easily replaceable to restore original pump efficiency and eliminate the need for replacing the entire pump casing due to wear.

MECHANICAL PUMP SEALS

Stuffing boxes will be integral with the pump body and be equipped with self-adjusting, maintenance free mechanical shaft seals.

PUMP TRANSMISSION

The pump transmission will 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 will be capable of operating at high speeds to provide smooth, quiet transfer of power. The shift engagement will be accomplished by a free-sliding collar and will incorporate an internal locking mechanism to insure that the collar will be maintained in ROAD or PUMP position.

PUMP RATIO

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

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

PUMP SHIFT

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

The pump shift will 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 will include a detent lock to prevent accidental shifting.

EMERGENCY PUMP SHIFT

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

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

PUMP SHIFT INDICATORS LIGHT

The pump shift assembly will incorporate an indicating light system which will 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 will have a lock-up assembly which brings the transmission to direct drive and prevents the transmission from shifting gears while in the pumping mode.

BRAKING SYSTEM

A positive braking system will 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 will be furnished. These will be bolted to the frame rails in such a position to perfectly align the pump so that the angular velocity of the drive line joints will be the same on each end of the drive shaft. This will assure full capacity performance with a minimum of vibration. Mounting hardware will utilize Grade 8 bolts.

PUMP MANIFOLDS

A custom made suction and discharge manifold will be constructed from stainless steel and/or flexible tubing. The manifold will be designed to provide maximum efficiency for the suction inlets and the discharges. .

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

FIRE RESEARCH "IN-CONTROL" PRESSURE GOVERNOR

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

The following continuous displays will be provided:

- Pump discharge; shown with four daylight bright LED digits more than 1/2" high.
- Pump Intake; shown with four daylight bright LED digits more than 1/2" high.
- Pressure / RPM setting; shown on a dot matrix message display.
- Pressure and RPM operating mode LEDs.
- Throttle ready LED.
- Engine RPM; shown with four daylight bright LED digits more than 1/2" high.
- Check engine and stop engine warning LEDs.
- Oil pressure; shown on a dual color (green/red) LED bar graph display.
- Engine coolant temperature; shown on a dual color (green/red) LED bar graph display.
- Transmission Temperature: shown on a dual color (green/red) LED bar graph display.
- Battery voltage; shown on a dual color (green/red) LED bar graph display.
- The dot-matrix message display will show diagnostic and warning messages as they occur. It will show monitored apparatus information, stored data, and program options when selected by the operator. All LED intensity will be automatically adjusted for day and night time operation.

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

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

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

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

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

AKRON INTAKE RELIEF VALVE

A 300 psi adjustable Akron Model 591103 intake relief valve system will be plumbed on the suction side of the pump to comply fully with NFPA-1901 requirements. Excess pressures will be plumbed to discharge water under the pump enclosure away from the pump operator.

PUMP CERTIFICATION

The pump will be third party performance tested to meet the requirements of NFPA-1901. To ensure top quality and integrity, the test company will 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.

FRONT SUCTION REMOTE PRIMING VALVE

An additional primer control valve will be furnished to prime the front suction. The Trident Emergency products RPV (remote priming valve) will 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 will be provided and controlled at the lower portion of the side pump panel. The valve will be located in pump compartment lower than the main body and connected in such a manner as to allow complete water drainage of the pump body and all required accessories. Water will be drained below the apparatus body and away from the pump operator.

INDIVIDUAL BLEEDERS AND DRAINS

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

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

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

All drains and bleeders will discharge below the running boards.

SYNFLEX SUCTION, DISCHARGE, PRESSURE AND CONTROL LINES

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

PUMP MODULE

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

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

DUNNAGE AREA

A dunnage area will be provided above the pump enclosure for equipment mounting and storage. This area will be furnished with a removable 3/16" aluminum tread plate floor and will be enclosed on the sides.

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

The heigh of the Dunnage area shall not exceed or drop below the height of the cab.

DRIVER SIDE PUMP PANEL ROLL-UP DOOR

The entire driver side pump panel will be enclosed with a roll-up door. The roll-up door will be mounted to aluminum framework, which will extend to the edge of the running board step to allow maximum clearance behind the roll-up door. The framework will be full width and height of the pump enclosure.

Due to limited space between the pump panel and the pump panel enclosure door(s), LDH adapters and external intake valves will be shipped loose.

OFFICER SIDE PUMP PANEL ROLL-UP DOOR

The entire officer side pump panel will be enclosed with a roll-up door. The roll-up door will be mounted to aluminum framework, which will extend to the edge of the running board step to allow maximum clearance behind the roll-up door. The framework will be full width and height of the pump enclosure.

Due to limited space between the pump panel and the pump panel enclosure door(s), LDH adapters and external intake valves will be shipped loose.

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

SUCTION INLETS

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

PUMP SUCTION ENDS

The main pump suction inlets will be furnished with a short suction end, terminating with only the suction threads protruding through the side panel to minimize the distance an exterior appliance protrudes beyond the pump panel.

The two (2) suction caps provided as standard equipment will be deleted.

One (1) 6" NH x 4" Storz TFT Jumbo Ball Intake Valve AX1SP-NX 30° degree adapter and 4" storz cap will be provided for the driver side main suction inlet.

One (1) 6" NH x 4" Storz Jumbo Ball Intake Valve AX1SP-NX 30° degree adapter and 4" storz cap will be provided for the officer side main suction inlet.

FRONT SUCTION

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

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

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

The front inlet will be plumbed utilizing 5", schedule 10 stainless steel piping, 45 degree elbows and a limited number of 90 degree sweep elbows in an assembly from the pump to the front of the cab. A manual drain will be provided ahead of the front wheel and a panel controlled drain will be provided aft of the front wheel.

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

The front suction plumbing will be fitted with a Waterous "Monarch" valve, on the front suction inlet. The valve will be in the pump enclosure area with a manual override located directly on the valve actuator. The valve body and all related components that are in contact with water will be manufactured of fine grained, corrosion resistant bronze.

The valve will be operated by an air control, mounted on the operator's panel with function plate. The valve will not be able to move from fully open to fully closed in under three (3) seconds, in compliance with NFPA-1901.

The valve housing will incorporate a pressure relief valve, set at the pump manufacturers facility to a rating of 125 PSI. The pressure relief valve will provide protection for the suction hose even with the valve in the closed position. The valve will incorporated a NFPA compliance, large diameter hose air bleed valve, controlled at the operator's panel.

One (1) 6" NST chrome plated long handle vented cap(s) will be installed on front suction.

AUXILIARY SIDE SUCTION(S)

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

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

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

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

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

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

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

DUAL TANK TO PUMP

Two (2) 4" full flow tank to pump lines will be piped through the front bulkhead of the tank with a 90 degree elbow down into two (2) individual sumps located one (1) at front and one (1) at the rear of the tank. These lines will be plumbed directly into the rear of the pump suction manifold for maximum efficiency.

Each tank outlet will be equipped with an in-line check valve to prevent accidental pressurization of the water tank through these plumbing lines. Connection from the valves to the tank will be made using non collapsible flexible rubber hoses.

The sumps will be located with one (1) at the front of the tank and one (1) located at the rear of the tank for pumping on a grade for maximum water utilization.

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

Each tank to pump valve will be equipped with a separate push/pull control handle which will 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 will be provided. A deflector shield inside the tank will be furnished. Tank fill plumbing will utilize 2" high pressure hose for tank connection to accommodate flexing between components.

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

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

******* DISCHARGES & ACCESSORIES - SIDE MOUNT *******

DRIVER'S SIDE MAIN DISCHARGE #1

A discharge will be provided and located at the driver's side pump panel. The driver's side discharges # 1 will terminate with NST threads, through the left panel above the main pump intake.
The main pump discharge will be plumbed directly from the pump discharge manifold utilizing direct connect discharge valve flanges.

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

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

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

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

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

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

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

DRIVER'S SIDE MAIN DISCHARGE #2

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

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

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

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

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

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

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

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

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

OFFICER'S SIDE MAIN DISCHARGE #1

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

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

An Akron Brass 4" Heavy Duty Swing-Out™ Valve will be provided for the officer's side #1 discharge. The valve will have an all brass body with flow optimizing flat ball and dual polymer seats

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

The officer's side # 1 discharge cap provided as standard equipment will be deleted.

A 4" NSTF X 4" Storz Kochek S37S straight adapter with cap will be provided on the officer's side # 1 discharge.

The officer's side # 1 discharge valve will be gated with an Akron Hand wheel controlled, inline valve. The valve will be controlled at the pump operator's panel with a chrome plated hand wheel and mechanical valve position indicator.

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

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

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

OFFICER'S SIDE MAIN DISCHARGE #2

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

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

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

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

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

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

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

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

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

OFFICER SIDE REAR DISCHARGE

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

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

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

The officer side rear discharge will 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 will be furnished in this assembly to allow for flex and serviceability.

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

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

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

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

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

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

DECK GUN DISCHARGE

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

The deck gun discharge will be located in the dunnage area above the pump module on the officer's side of the vehicle. A pedestal type, 1/4" steel plate support assembly will be provided to stabilize deck gun plumbing below deck gun mount flange.

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

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

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

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

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

The deck gun discharge will be equipped with a 2 ½" diameter Innovative Controls pressure gauge. The gauge will have a rugged corrosion free stainless steel case and clear scratch resistant

molded crystals with captive O-ring seals to ensure distortion free viewing and seal the gauge. The gauge will be filled with glycerin to dampen shock and vibration, lubricate the internal mechanisms, prevent lens condensation and ensure proper operation from –40°F to +160°F.

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

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

HORIZONTAL SPEEDLAY #1

Speedlay #1 will be a transverse hose bed, which will be designed as an integral part of the pump module design, located forward of the pump just above the frame rails. Hose deployment will be accomplished from either side of the apparatus. The speedlay hose bed flooring will be designed to be removable, constructed from brushed finish, perforated aluminum material.

The speedlay #1 discharge will terminate through the rear wall of the hosebed with a 1 1/2" NSTM chicksan swivel adapter. The hosebed rear wall will be slotted to allow the swivel to through the wall, allowing the pre-connected hose to be pulled off either side of the apparatus without kinking the hose at the coupling connection.

Speedlay #1 will be designed to have a minimum total capacity of 3.5 cubic feet as required by NFPA -1901 to accommodate a minimum of 200 feet of 1-3/4" fire hose. The hose will be loaded in a double stack configuration.

The speedlay #1 discharge will be plumbed utilizing 2" schedule 10 stainless steel piping and/or flexible hose, 45 degree elbows and a limited number of 90 degree sweep elbows in an assembly from the pump to speedlay hosebed.

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

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

The speedlay #1 discharge valve will be controlled by a push/pull handle located on the operator's panel.

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

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

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

Bidder Complies	
Yes	No

SPEEDLAY #1 SLIDE-OUT TRAY

A 3/16" aluminum, three (3) sided, "J" shaped slide out tray will be provided for speedlay #1 to allow easy loading of the hose off the vehicle. The tray will be designed to slide out from either side of the vehicle. The sides and floor of the opening will be lined with Nylatron to assist in the loading of the tray.

The tray will have a cut out on each side of the tray so it may be used as a handle to remove the tray. The handle area will 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 will be provided for the tray to secure the tray in the speedlay opening.

HORIZONTAL SPEEDLAY #2

Speedlay #2 will be a transverse hose bed, which will be designed as an integral part of the pump module design, located forward of the pump just above the lower speedlay. Hose deployment will be accomplished from either side of the apparatus. The speedlay hose bed flooring will be designed to be removable, constructed from brushed finish, perforated aluminum material.

The speedlay #2 discharge will terminate through the rear wall of the hosebed with a 1 1/2" NSTM chicksan swivel adapter. The hosebed rear wall will be slotted to allow the swivel to through the wall, allowing the pre-connected hose to be pulled off either side of the apparatus without kinking the hose at the coupling connection.

Speedlay #2 will be designed to have a minimum total capacity of 3.5 cubic feet as required by NFPA -1901 to accommodate a minimum of 200 feet of 1-3/4" fire hose. The hose will be loaded in a double stack configuration.

The speedlay #2 discharge will be plumbed utilizing 2" schedule 10 stainless steel piping and/or flexible hose, 45 degree elbows and a limited number of 90 degree sweep elbows in an assembly from the pump to speedlay hosebed.

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

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

The speedlay #2 discharge valve will be controlled by a push/pull handle located on the operator's panel.

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

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

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

SPEEDLAY #2 SLIDE-OUT TRAY

A 3/16" aluminum, three (3) sided, "J" shaped slide out tray will be provided for speedlay #2 to allow easy loading of the hose off the vehicle. The tray will be designed to slide out from either side of the vehicle. The sides and floor of the opening will be lined with Nylatron to assist in the loading of the tray.

The tray will have a cut out on each side of the tray so it may be used as a handle to remove the tray. The handle area will 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 will be provided for the tray to secure the tray in the speedlay opening.

HORIZONTAL SPEEDLAY #3

Speedlay #3 will be a transverse hose bed, which will be designed as an integral part of the pump module design, located forward of the pump just above the lower speedlay. Hose deployment will be accomplished from either side of the apparatus. The speedlay hose bed flooring will be designed to be removable, constructed from brushed finish, perforated aluminum material.

The speedlay #3 discharge will terminate through the rear wall of the hosebed with a 2 1/2" NSTM chicksan swivel adapter. The hosebed rear wall will 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 #3 will be designed to have a minimum total capacity of 3.5 cubic feet as required by NFPA -1901 to accommodate a minimum of 200 feet of 2 1/2" fire hose. The hose will be loaded in a triple stack configuration.

The speedlay #3 discharge will 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 speedlay hosebed.

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

An Akron Brass 2 1/2" Generation II Swing-Out™ Valve will be provided for the speedlay #3 discharge. The valve will have an all brass body with flow optimizing stainless steel ball and dual polymer seats.

The speedlay #3 discharge valve will be controlled by a push/pull handle located on the operator's panel.

The speedlay #3 discharge will be equipped with a 2 ½" diameter Innovative Controls pressure gauge. The gauge will have a rugged corrosion free stainless steel case and clear scratch resistant molded crystals with captive O-ring seals to ensure distortion free viewing and seal the gauge. The gauge will be filled with glycerin to dampen shock and vibration, lubricate the internal mechanisms, prevent lens condensation and ensure proper operation from –40°F to +160°F.

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

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

SPEEDLAY #3 SLIDE-OUT TRAY

A 3/16" aluminum, three (3) sided, "J" shaped slide out tray will be provided for speedlay #3 to allow easy loading of the hose off the vehicle. The tray will be designed to slide out from either side of the vehicle. The sides and floor of the opening will be lined with Nylatron to assist in the loading of the tray.

The tray will have a cut out on each side of the tray so it may be used as a handle to remove the tray. The handle area will 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 will be provided for the tray to secure the tray in the speedlay opening.

SPEED LAY HOSEBED HOSE RETENTION

Vinyl coated polyester covers will be provided on each side of the speed lays to retain hose in the speed lays. The covers will be secured with expandable loops sewn into the covers and hooks on the apparatus.

The speed lay end flap will be red in color.

BOOSTER REEL #1 DISCHARGE

A 1 1/2" booster reel discharge will be plumbed from the pump to the booster reel.

The booster reel discharge will be plumbed from the valve to the hose reel utilizing 1" high pressure hose. The end of the hose connected to the hose reel will be equipped with a swivel end for ease in hose replacement.

A 1 1/2" Akron, #8800 series, full flow, stainless steel ball valve will be provided for the booster reel #1 discharge.

The booster reel discharge valve will be controlled by a push/pull handle located on the operator's panel.

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

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

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

BOOSTER REEL #1

One (1) painted steel electric rewind booster reel will be furnished. The reel will be equipped with a one (1) inch 90° full flow swivel joint and an adjustable brake for freewheeling, drag or full lock operation. Color will be graphite.

The booster reel #1 will be mounted at the apparatus rear, in a framework mounted to the chassis frame rails.

Booster reel rewind will be controlled by a push button on the rear body panel near the rear step compartment. The booster reel circuit will be equipped with a shielded toggle switch to act as a booster reel disconnect to avoid accidental actuation of the booster reel rewind button.

Booster reel shall be equipped with a manual crank override in the event of power failure.
Each booster reel will be equipped with 200' of 1" "jacketed" booster hose in 100' sections. Each length will be fitted with NST couplings.

A captive roller arrangement will be provided around the perimeter of the rear opening of the hose reel storage area allowing hose to be pulled out in any direction.

****** CONCENTRATE PIPING & FOAM SYSTEM ******

FOAM PIPING - 1 INCH BRASS

All foam concentrate plumbing from the tank or auxiliary foam inlet to the foam system components will be brass and nonferrous material.

The foam system piping will incorporate a check valve to prevent water from entering the foam tank; the discharge piping will also include a check valve to prevent foam solution from back feeding into the discharge side of the pump. Individual discharge piping will be as specified for each discharge.

The complete foam system will be tested in accordance with NFPA-1901.

WATEROUS ADVANTUS 3 FOAM SYSTEM

The apparatus will be equipped with an automatic microprocessor controlled, conductivity based, direct injection, discharge side foam proportioning system. The installed system will be capable of accurately proportioning all commercially available Class A foam concentrates and most Class B foam concentrates. The foam proportioning operation will utilize electrical conductivity measurements of the incoming water and foam solution as well as measured water flow to provide highly accurate and consistent mix ratios within the specified flows and pressures. The system must be accurate over the specified operation range when installed according to the instructions contained in the factory supplied installation manual.

FOAM SYSTEM MICROPROCESSOR CONTROLLER

A 16-bit mixed signal micro controller with 60 kB flash memory, 2 kB RAM and 12-bit analog to digital converter will be utilized to receive input from the incoming water conductivity probe, flow meter and foam solution conductivity probe, compare values and control the foam pump motor, providing accurate injection into the foam process manifold per the operator selected mix ratio. The controller and related electronics will be located inside a sealed aluminum housing which is mounted to the motor/pump mounting base plate. All electrical components of the foam system will be sealed to NEMA 4 X standards or equivalent, suitable for mounting inside the apparatus pump compartment.

FOAM SYSTEM OPERATION INTERFACE TERMINAL

The system will be equipped with an operator interface terminal (OIT) which will be mounted on the pump operators' panel. The OIT housing will be constructed of aluminum with chrome plated finish. A polycarbonate overlay with integral labeling will be provided on the face of the OIT. The OIT will be fastened to the pump panel with four stainless steel, swing-out, self adjusting compression latches which eliminate the use of screws, nuts or bolts in the attachment. The digital display will consist of four .56" high digits, each with seven segment ultra-bright LEDs and seven ultra-bright status LEDs. Four flush mounted pushbutton controls will be provided on the control face which are constructed of stainless steel and designed for millions of cycles in severe duty applications.

The OIT will enable the pump operator to perform the following functions for the foam system:

- Provide push-button control of foam proportioning rates from 0.1% to 1%, in 0.1% increments;
  3% and 6%
- Show current flow-per-minute of water
- Show total volume of water discharged during and after foam operations are completed
- Show total amount of foam concentrate used
- Show which foam supply tank is in use
- Perform setup and calibrate functions for the micro controller
- Flash a "low concentrate" warning when the foam concentrate tank(s) run(s) low
- Flash an "error" warning with associated code in the event of an electronic malfunction
- Provide a manual back-up mode, controlled by the operator
- Means will be provided for pre-selection of measurement units: U.S. Gallons, Imperial Gallons

FOAM SYSTEM REMOTE ACTIVATION

The system can be activated from an external 12 or 24-volt electrical source, such as a pump-in-gear circuit or engine ignition on, which can eliminate one step in the operation sequence.

FOAM SYSTEM FLOWMETER

A paddlewheel-type flow meter will be installed in the process manifold upstream of the foam injection point and will be connected to the micro controller. A 316 stainless steel paddlewheel with a carbide axle will be utilized for improved accuracy and long life. The flow meter will have a 500 PSI (34 BAR) pressure rating per NFPA requirements. The flow meter function on the OIT will display the water rate of flow in real time as well as the total water used during and after foam operations.

FOAM PUMP

A 12 volt electric motor driven Hydra-Cell positive displacement foam concentrate pump, rated at 3 GPM (11.3 LPM) at 150 psi (10 BAR) and with operating pressures up to 450 psi (32 BAR), will be installed in a suitable, serviceable location. The system will draw a maximum electrical load of 40 amps @ 12 VDC or 21 amps @ 24 VDC. A pump motor electronic driver, located inside the controller housing will receive signals from the micro controller and power the 1/2 hp (.4 Kw) electric motor in a variable speed duty cycle to ensure that the correct amount of foam concentrate as set by the pump operator is injected into the water stream. The highly efficient Hydra-Cell Industrial diaphragm pump is a hydraulically balanced diaphragm pump offering many inherent advantages over other types of pumps for pumping foam concentrates.

The Hydra-Cell pump converts rotating motion into linear motion by means of a drive shaft assembly, sequentially moving hydraulic pistons which are filled with oil in a rearward and forward stroke. The oil held in the piston balances the back side of the diaphragm and causes them to flex forward and back providing the pumping action.

To provide long lasting, trouble-free diaphragm life, the Hydra-Cell hydraulically balances the diaphragm over the pumps entire pressure range, even at peak pump pressures. Each diaphragm has its own pumping chamber with its own suction and discharge valve assembly, so as each diaphragm strokes back, fluid enters the pump through the inlet and on the forward stroke the diaphragm forces the fluid through the discharge valve assembly into the outlet manifold and out of the pump. All of the diaphragms in the pump are equally spaced from one another while overlapping pumping strokes result in low discharge pulsation. Pump output flow will be proportional to pump shaft speed (RPM) regardless of pressure, thus a linear flow relationship will exist with increasing or decreasing pump RPM.

The pump will be self priming and capable of drawing foam concentrate from reservoirs or containers which are located below the pump inlet. Lift time and distance will depend on product viscosity. Overboard foam sources may be utilized when the apparatus is equipped with the proper piping, connections and selector valve(s).

For reduced maintenance, the pump will utilize no packing, cups or seals. All metal pump components which may come in contact with foam concentrate will be brass or stainless steel, making the pump resistant to chemical and corrosive attack. It will be capable of handling suspended abrasives without sustaining any damage. The pump will also be capable of running dry for extended periods without sustaining damage.

Accurate concentration proportioning can be achieved, based on the following water flows:

- 1000 GPM water 0.3% concentration
- 600 GPM water 0.5% concentration
- 300 GPM water 1.0% concentration
- 100 GPM water 3.0% concentration
- 50 GPM water 6.0% concentration

FOAM SYSTEM CONTROL CABLES & CONNECTORS

The cables for interconnection of the control unit, OIT, conductivity sensors and flow meter will be electrically shielded to prevent radio frequency or electro-mechanical interference.

FOAM SYSTEM LOW TANK LEVEL SWITCH

A Waterous # 4190000 low tank level float switch will be installed in each foam concentrate tank and connected to the control unit to alert the operator to low foam supply conditions.

FOAM SYSTEM SCHEMATIC

A Waterous # 0315279 placard will be installed on the pump panel.

FOAM SYSTEM PROCESS MANIFOLD 2", 2.5" or 3" ID

The foam system process manifold will be constructed of Schedule 10 316 stainless steel. Victaulic groove connections will be provided at each end of the manifold for connection to the apparatus plumbing.

The process manifold will include an incoming water conductivity probe, paddlewheel flow meter, foam injection check valve, Akron Brass waterway check valve and foam solution conductivity probe.

An Akron full-flow brass body check valve will be provided in the foam process manifold waterway to prevent foam contamination of fire pump and water supply.

A check valve constructed of brass and stainless steel will be provided in the foam concentrate line at the foam injection point to prevent water back flow into the foam supply reservoir(s).

Conductivity probes will be constructed of 316 stainless steel and include gap spacers and a reverse charge feature to prevent build-up of deposits on the probe surfaces.

The process manifolds, with all associated components installed, will have the following flow ratings at 150 PSI:

- 2" 300 GPM
- 2.5" 500 GPM

- 3" 1000 GPM

FOAM SYSTEM COMPONENTS

Components of the complete foam system supplied by Waterous will include:

- Operator interface terminal
- Pump module with electric motor/motor driver and micro controller unit
- Foam concentrate strainer
- Shielded electrical cables for connection of all electronic components
- Process manifold - 2" ID (standard) 2.5" or 3" ID (optional) - with flow meter and associated components as specified
- Low level tank switch
- System diagram and rating placards (per NFPA 1901) for pump panel mounting
- Installation, operation and service manuals

An installation and operation manual will be provided for the unit along with a copy of the warranty policy. The system must be installed and serviced by an authorized Waterous OEM or service center.

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 will be equipped with a properly sized flow meter sensor, based on the systems capabilities.

The foam system will be plumbed to the following discharge/s through the discharge piping or manifold system:

Speedlay #1 discharge.

Speedlay #2 discharge

Speedlay #3 discharge.

Officer's side rear discharge.

The foam proportioning system will be supplied from the foam concentrate storage tank/s. The tank/s will be constructed of materials compatible with foam concentrates being used in the system. Tank capacity, venting, fill opening and foam outlet plumbing connections will be in accordance with NFPA requirements. Foam tank lid will be sealed and latched in accordance with NFPA standards. If required a provision will be made for installation of low tank level sensors and routing of the wiring for the sensors.

****** PUMP PANEL & ACCESSORIES *******

PUMP PANEL - SIDE MOUNT

The pump operator's control panel will be located on the driver side of the apparatus. The pump enclosure side panels will be completely removable and designed for easy access and servicing.

PUMP PANEL MATERIAL

The left side operator's panel, gauge panel, right side pump panel and right side access door will be fabricated from 14-gauge 304L stainless steel with a #4, (150/180 grit), standard brushed finish.

HINGED GAUGE PANEL

A full width, vertically hinged gauge access panel will be provided at the operator's position. Chrome plated positive locks will be provided along with chain holders to prevent the front of the gauge panel from coming in contact with other panels when open.

VERTICALLY HINGED, SPLIT PUMP PANEL OFFICER SIDE

The officer's side pump panel will be split, vertically hinged, to provide complete access to the pump and plumbing on the officer side of the pump enclosure. The panels will be equipped with stainless steel hinges and secured with push type locks to hold the panels closed. The drains located on the officer's side panel will be fastened to the lower panel, which will be stationary.

PANEL FASTENERS

Stainless steel machine screws and lock washers will be used to hold these panels in position. The panels will be easily removable to provide complete access to the pump for major service.

CAPS AND ADAPTERS SAFETY TETHER

All applicable discharge and suction caps, plugs and adapters will be equipped with chrome plated ball chain and secured to the vehicle.

PUMP PANEL TRIM PLATES

A high polished trim plate will be provided around each discharge port and suction inlet opening to allow accessibility to the respective valve for service and repairs.

DISCHARGE GAUGE TRIM BEZELS

Each individual discharge gauge will be installed into a decorative chrome-plated mounting bezel that incorporates valve-identifying verbiage and color labels.

COLOR CODED IDENTIFICATION TAGS

Color coded identification tags will be provided for all gauges, controls, connections, switches, inlets and outlets.

PUMP OPERATOR'S PANEL

Particular attention is to be given to functional arrangement of all controls. The pump operator's panel will 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 #TGA400 "IN CONTROL" pressure governor control.

PUMP TEST PORTS

The pump panel will be equipped with Vacuum & Pressure test plugs to allow for test equipment to monitor pump pressure and vacuum levels. Chrome plugs and labels will be provided for the test ports.

MASTER GAUGES

One (1) 4" diameter pressure gauge (labeled: "PRESSURE") and one (1) 4" diameter compound vacuum gauge (labeled: "INTAKE") will be provided. The master gauges will be Innovative Controls glycerin filled. The gauge faces will be white with black numerals.

PRESSURE & COMPOUND GAUGE RANGES

All applicable pressure gauges will have a range of 0 - 400 P.S.I., and the compound gauge will have a range of -30" - 0 - 400 P.S.I.

ENGINE COOLER

An auxiliary cooler or heat exchanger will be installed in the engine compartment between the engine and the chassis radiator. The cooler will permit the use of water from the pump for cooling the engine. The cooling will be done without mixing engine and pump water.

TANK LEVEL GAUGE

A Fire Research, model #WLA300-A00, "TANKVISION" gauge that shows the actual volume of water in the tank will be provided on the pump operator's panel. The "TANKVISION" gauge is designed for both ease of operation and installation. The "TANKVISION" gauge utilizes ultra bright multi color LEDs for sunlight readability and also uses 2 specially designed wide-viewing lens for 180° of clear viewing. The "TANKVISION" gauge utilizes a pressure sender to measure the liquid volume. The gauge will be equipped with a self-calibration feature that allows the 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 will 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 will 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 will be provided on both sides of the cab. Each side will have a Whelen model PSTANK, LED strip light, surface mounted, behind the rear crew door above the handrail.

The strip light will indicate the following water levels:

- Green LED cluster — Full tank
- Blue LED cluster — 3/4 tank
- Amber LED cluster — 1/2 tank
- Red LED cluster — 1/4 tank

The red LED's will burn steady to indicate 1/4 tank and will start to flash when the water level drops below 1/4 tank. To prevent distraction to drivers, this tank level gauge will be wired to display only when the park brake is engaged.

LARGE LIGHT WATER LEVEL GAUGE, REAR OF BODY

A large light water level gauge system will be provided on the rear of the body. The Whelen model PSTANK, LED strip light will be surface mounted.

The strip light will be mounted as to 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 will burn steady to indicate 1/4 tank and will start to flash when the water level drops below 1/4 tank. To prevent distraction to drivers, this tank level gauge will be wired to display only when the park brake is engaged.

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 will be provided on the pump operator's panel. The "TANKVISION" gauge is designed for both ease of operation and installation. The "TANKVISION" gauge utilizes ultra bright multi color LEDs for sunlight readability and also uses 2 specially designed wide-viewing lens for 180° of clear viewing. The "TANKVISION" gauge utilizes a pressure sender to measure the liquid volume. The gauge will be equipped self-calibration feature allows the TANKVISION gauge to be used on tanks of different shapes and sizes.

The gauge will 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 will have a capacity of 1000 gallons, constructed from Poly material.

FOAM TANK "A"

In addition to the water capacity of the tank, a 30 gallon integral foam storage area will be built into the water tank. The foam tank will have a latched fill tower, properly labeled as the foam fill point. A valved drain will be provided.

WATER TANK CONSTRUCTION

The Poly water tank will be constructed of PT3 polypropylene material. This material will be a non-corrosive stress relieved thermoplastic and UV stabilized for maximum protection. Tank shell thickness may vary depending on the application and may range from 1/2 to 1" as required. Internal baffles are generally 3/8" in thickness.

The tank will be of a specific configuration and is so designed to be completely independent of the body and compartments. Joints and seams will be fused using nitrogen gas as required and tested for maximum strength and integrity. The tank construction will include PolyProSeal technology wherein a sealant will be installed between the plastic components prior to being fusion welded. This sealing method will provide a liquid barrier offering leak protection in the event of a weld compromise. The top of the booster tank is fitted with removable lifting assembly designed to facilitate tank removal. The transverse and longitudinal swash partitions will be manufactured of a minimum of 3/8" PT3 polypropylene. All partitions will be equipped with vent and air holes to permit movement of air and water between compartments. The partitions will be designed to provide maximum water flow. All swash partitions interlock with one another and are completely fused to each other as well as to the walls of the tank. All partitions and spacing will comply with NFPA 1901. The walls will be welded to the floor of the tank providing maximum strength as part of the tank's unique Full Floor Design. Tolerances in design allow for a maximum variation of 1/8" on all dimensions.

WATER CAPACITY CERTIFICATION

All tanks will be tested and certified as to capacity on a calibrated and certified tilting scale. Each tank will be weighed empty and full to provide precise fluid capacity. Each Poly-Tank's III is delivered with a Certificate of Capacity delineating the weight empty and full and the resultant capacity based on weight.

WATER TANKNOLOGY TAG

A tag will be installed on the apparatus in a convenient location and contain pertinent information including a QR code readable by commercially available smart phones. The information contained on the tag will include the capacity of the water and foam (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 will be constructed of 1/2" thick PT3 polypropylene and UV stabilized, to incorporate a multi-piece locking design, which allows for individual removal and inspection if necessary. The tank cover(s) will be flush or recessed 3/8" from the top of the tank and will be fused to the tank walls and longitudinal partitions for maximum integrity. Each one of the covers will have hold downs consisting of 2" minimum polypropylene dowels spaced a maximum of 40" apart. These dowels will extend through the covers and will assist in keeping the covers rigid under fast filling conditions. A minimum of two lifting dowers will accommodate the necessary lifting hardware.

WATER TANK FILL TOWER

The tank will have a combination vent and manual fill tower. The fill tower will be constructed of 1/2" PT3 polypropylene and will be a minimum dimension of 12" x 12" outer perimeter. The fill tower will be blue in color indicating that it is a water-only fill tower. The tower will be located in the left front corner of the tank unless otherwise specified by the tank manufacturer to the purchaser. The tower will have a 1/4" thick removable polypropylene screen and a PT3 polypropylene hinged cover. The capacity of the tank will be engraved on the top of the fill tower lid. Inside the fill tower there will be a combination vent/overflow pipe. The vent overflow will be a minimum of schedule 40 polypropylene pipe with a minimum I.D. of that is designed to run through the tank, and will be piped to discharge water behind the rear wheels as required in NFPA 1901 so as to not interfere with rear tire traction.

WATER TANK OVERFLOW AND VENT PIPE

The fill tower will be fitted with an integral 4" I.D. schedule 40 P.V.C. combination overflow/vent pipe running from the fill tower through the tank to a 4" coupling flush mounted into the bottom of the tank to allow water to overflow behind the chassis rear axle.

WATER TANK SUMP

The tank sump will be a minimum of 10" wide x 10" long x 3" deep. An anti-swirl plate will be mounted inside the sump, approximately 1" above the bottom of the sump.

WATER TANK SUMP CONNECTION

The front bulkhead of the water tank will be fitted with two connections, one (1) to front sump and one (1) to rear sump.

WATER TANK 3" SUMP DRAIN

A 3" drain plug will be provided.

THROUGH POLY WATER TANK - LADDER STORAGE

The ground ladders will be stored horizontally within a sleeve in the water tank.

WATER TANK FLANGES/OUTLETS - PUMPER

There will be two (2) standard tank outlets; one for tank-to-pump suction line which will be a minimum of 4" coupling and one for a tank fill line which will be a minimum of a 2" NPT coupling. All tank fill couplings will be backed with flow deflectors to break up the stream of water entering the tank.

WATER TANK MOUNTING ALL "T" TANKS - PUMPER

The tank will rest on the body cross members spaced a maximum of 22" apart, and will be insulated from these cross members with a minimum of 3/8" nylon webbing or 1/2" rubber, 2-1/2" wide. The tank will sit cradle-mounted using four (4) corner angles of 6 x 6 x 4 x 0.250 welded directly to the body cross members. The angles will keep the tank from shifting left to right or front to rear. The tank is designed on the free-floating suspension principle and will not require the use of hold downs. The

tank will be completely removable without disturbing or dismantling the apparatus body structure. The body or hose bed cross braces will act as water tank retainers.

DIRECT TANK FILL - DRIVER SIDE

One (1) 2-1/2" NST direct tank fill will be provided at the rear of the body, on the driver side, as low as possible. The direct tank fill will be gated with a 2-1/2" Akron ball valve with a swing handle. The fill will be equipped with a 30 degree elbow terminating with a 2-1/2" NST female swivel connection. A quarter turn drain valve will be supplied to bleed off excess pressure with a drain hose routed beneath the rear step area.

APPARATUS BODY DESIGN CONSTRUCTION

The body side and compartment assemblies will be designed and assembled to provide maximum strength and durability under all operating conditions.

Special attention will be taken to minimize corrosion on all fabricated parts and structural members of the body. All bolt-on components will be provided with a dissimilar metals isolation barrier to prevent electric corrosion. The body design will also incorporate removable panels to access spring hangers, rear body mounts and fuel tank sending units.

The body assembly will be an all-welded configuration. The body will be completely isolated from the cab and pump module structure.

Dimensions used in this specification will be the general outer dimension taken from a typical line diagram of the apparatus. These dimensions will not take into account items like material thickness, access panels, doors, and other installed options.

COMPARTMENT TOPS

Compartment ceilings will be a fully welded design as part of the body construction process. Compartment designs that do not have a welded in ceiling will not be acceptable.

COMPARTMENT DRIP MOLDING

Compartment doors will have drip molding to provide protection against water runoff.

REAR BODY PANEL

The rear body panel will extend the full width between the body side compartments. This panel will be full height from the rear step to the hose bed floor. No part of the rear panel will be attached to the booster tank. The rear body panel material will be aluminum tread plate as standard. If Chevron striping is specified for the rear of the body then smooth aluminum will be utilized.

BODY AND COMPARTMENT FABRICATION - 3/16" ALUMINUM

All compartment panels and body side sheets will be fabricated entirely of 3/16" aluminum (5052-H32). Each side compartment assembly will be both plug welded and stitch welded to ensure proper weld penetration on all panels while avoiding the possible warping caused by a full seam weld. The side compartments will be welded on a fixture to ensure true body dimensions of all door openings. The side compartments and body side panels are then set into a body squaring fixture where the super structure is installed and the entire body is aligned to be completely symmetrical. The super structure is then welded to the compartment side panels and reinforcement plates are inserted which allows the compartment panels to become an integral component of the body support structure. A full seam weld will not be used due to the applied heat which will distort sheet metal and remove the protective coating from the perimeter of the welded area. All seams will be caulked prior to finish paint to ensure proper compartment seal.

SUB STRUCTURE - ALUMINUM

The body sub structure will be an all welded configuration utilizing a combination of 3" x 1-1/2" 6061-T6 thick walled structural tubing and 6061 structural channel.

This structure will be designed to totally support the full length and width of the body and will be welded to the body side compartments by use of reinforcement plates to incorporate the compartments into an integral part of the body weldment.

The sub structure will be bolted to the sides of the chassis frame at four (4) points. The two (2) forward mounting points will utilize a spring mount to help isolate the body from chassis deflection.

This design will provide storage capacity in each side compartment for a minimum of 500 lbs of equipment, and a minimum of 1000 lbs of equipment in the rear step compartment.

FIRE BODY WIDTH

The fire body will be 100" wide to provide the maximum amount of usable hose bed and compartment space. The side body compartments will be 29" deep in any full depth areas, and 14" deep in any split depth areas.

FIRE BODY HEIGHT

The fire body shall not extend any higher or drop any lower than the height of the cab.

BODY FENDER

The body fender will be 64" long, this will allow for the suspension and related components to be contained within the fender, preventing any intrusion into the body compartment storage area. Bodies with notches in the front and/or rear compartment for suspension components are not acceptable.

DRIVER SIDE - FRONT SECTION OF FENDER

A slide out absorbent bin will be installed in this fender position. The storage bin will be constructed of smooth aluminum and will be sized to store a minimum of 40 lbs of absorbent material. The bin will be installed on sliding locking tracks that allow the bin to extend out of the body fender for dumping/filling. There will 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.

Absorbent bins that are built into the fender and do not provide a means for sliding the bin out for loading and dispensing will not be acceptable due to the difficulty in loading/unloading.

DRIVER SIDE - REAR SECTION OF FENDER

A storage compartment will be inserted into the fender to provide a storage area for two (2) customer supplied SCBA cylinders (or fire extinguishers of similar size). The storage area will be sized as tall and wide as possible in the fender (minimum of 15" wide x 7-3/4" tall), and will be 26" deep. The compartment will have a non-abrasive lined cradle storage area for each of the devices.

This storage compartment will provide a minimum of 1.6 cubic feet of storage space.

OFFICER SIDE - FRONT SECTION OF FENDER

A storage compartment will be inserted into the fender to provide a storage area for three (3) customer supplied SCBA cylinders (or fire extinguishers of similar size). The storage area will be sized as tall and wide as possible in the fender (minimum of 14" wide x 15" tall with an angled floor by fender

radius), and will be 26" deep. The compartment will have a non-abrasive lined cradle storage area for each of the three (3) devices.

This storage compartment will provide a minimum of 2.3 cubic feet of storage space.

OFFICER SIDE - REAR SECTION OF FENDER

A storage compartment will be inserted into the fender to provide a storage area for three (3) customer supplied SCBA cylinders (or fire extinguishers of similar size). The storage area will be sized as tall and wide as possible in the fender (minimum of 14" wide x 15" tall with an angled floor by fender radius), and will be 26" deep. The compartment will have a non-abrasive lined cradle storage area for each of the three (3) devices.

This storage compartment will provide a minimum of 2.3 cubic feet of storage space.

FENDER STORAGE DOORS

The fender storage area(s) will be enclosed by a hinged door fabricated from the same material as the primary body construction, and painted the primary body color. The back side of the door will have a section of Nylatron installed to protect the door surface from the items stored in the compartment. Each door will be tied into the compartment door ajar/do not move apparatus warning system.

DRIVER SIDE BODY COMPARTMENTATION

One full height/full depth compartment will be provided forward of the rear wheels. The compartment dimensions will be 49" wide x 68" tall x 29" deep.

One high side compartment will be provided above the rear wheels. The compartment dimensions will be 64" wide x 37" high x 29" deep.

One full height/full depth compartment will be provided behind the rear wheels. The compartment dimensions will be 56" wide x 68" tall x 29" deep.

The driver side compartments will provide approximately 160 cubic feet of storage space.

OFFICER SIDE BODY COMPARTMENTATION

One full height/full depth compartment will be provided forward of the rear wheels. The compartment dimensions will be 49" wide x 68" tall x 29" deep.

One high side compartment will be provided above the rear wheels. The compartment dimensions will be 64" wide x 37" high x 29" deep.

One full height/full depth compartment will be provided behind the rear wheels. The compartment dimensions will be 56" wide x 68" tall x 29" deep.

The officer side compartments will provide approximately 160 cubic feet of storage space.

REAR STEP COMPARTMENT

An equipment storage compartment will be provided on the rear of the body at the rear step area. The rear step compartment will be 42" Wide x 40" High x 29" Deep.

The rear step compartment will provide approximately 28 cubic feet of storage space.

The rear step compartment will be designed to have open through storage to the side body compartments. This open through storage area will be in the lower section of the side body compartments only.

The rear step compartment will be equipped with a roll up style door.

EXTENDED REAR STEP - TAPERED CORNERS

The extended rear step will be 12" deep, extended beyond the body compartments. The step will be 100" wide, with tapered corners for better clearance. The step will be fabricated from 3/16" polished aluminum tread plate, and will be rigidly reinforced.

The rear edge of the step will be designed to accommodate the rear clearance lights, recessed for protection in the step reinforcement channel. The step will be bolted into place with a minimum 1/2" clearance gap between the step and rear body panel.

BODY ROOF COMPARTMENTS (DRIVER'S SIDE)

Roof hatch style compartments will be provided the full length of the body, on the driver's side of the body hose bed area and will be designed as an integral extension of the lower side compartments with a painted exterior finish. Drain tubes will be provided at each end of each side compartment which will extend down through the lower compartments.

Each side roof compartment will extend the length of the body, which will be evenly divided into three (3) individually accessed areas, which will be open through from the front to the rear. The compartment depth will extend from the ceiling area of the upper side compartments to the top of the body. The interior compartment width of each side roof compartment will be a minimum of 25-1/2" inside width with a 22" wide access door at the top.

Each roof compartment will be equipped with an overlapping, hinged lift up tread plate door. These doors will be constructed of 3/16" aluminum tread plate with a 15 degree break on all sides. Each door will have two (2) gas shock style stay open devices which will also retain the door in the closed position.

Protective panels will be applied inside the compartments to cover any exposed wiring or recessed side body lighting, provided on the unit. These panels will reduce the overall usable compartment area in the compartments.

SAFETY LANDING

To provide a safe egress to the top of the body, the drivers side rear roof compartment will terminate 18" forward of the rear of the body. This recessed pocket will allow a stepping surface at the top of the roof access ladder. The floor and outboard wall of the recess will be overlaid with 1/8" aluminum tread plate.

If the stepping surface from the floor to the top of the coffin box is over 18 inches, a folding step will will be installed.

A step light will be provided to illuminate the stepping surfaces of this area.

NFPA compliant grab rails will be provided where needed.

COFFIN COMPARTMENT - STOKES STORAGE

The lower section of the driver side coffin compartment will be configured for storage of a stokes basket. The storage area will be sized to accommodate a stokes basket 84.5" Long x 24" wide x 7.5" deep. The floor of the stokes storage area will be lined with Nylatron to assist with sliding the stokes in and out. A brushed aluminum panel will be installed above the stokes storage area and

forward of the storage area to allow for storage of equipment in the remaining coffin compartment space.

A lift up style door will be installed on the rear body surface to remove the stokes basket from the storage area. The door will be horizontally hinged at the top, secured closed with a D-ring style handle, and secured in the open position with a gas shock stay arm. This door will be tied into the do not move apparatus warning system.

HOSE BED (70" WIDE)

The hose bed will be located directly above the booster tank and will be free from all sharp objects such as bolts, nuts, etc., to avoid damage to fire hose.

One side hose bed wall will be formed by the inside wall of the coffin compartment. The other side hose bed wall will be a 3" thick wall to provide a mounting surface for devices like warning lights and scene lights. The front wall will be flanged inward 2" with a 1" downward return to provide additional rigidity to the front wall.

HOSE BED CAPACITY

The hose bed will be designed with enough storage capacity to carry the following customer specified hoseload:

- 1000 Feet of 4" supply hose
- 500 Feet of 3" supply hose
- 250 Feet of 2-1/2" attack hose

HOSE BED FLOORING

Flooring to be constructed from extruded aluminum and be properly spaced for ventilation. The flooring will be smooth and free from sharp edges to avoid hose damage. The hose bed floor will be removable to provide access to inner body framework.

HOSE BED PARTITION

Two (2) fully adjustable 3/16", aluminum hose bed partition will be provided. Partition will be easily adjustable by means of channels located at the front and rear of the hose bed. Partition will be removable for access to the booster tank.

VINYL HOSE BED COVER - FASTENERS AND VELCRO

A hose bed cover will be provided and installed. The cover will be made from 22 ounce; heavy-duty vinyl coated polyester fabric (TXN 226). The cover will be sewn with ultraviolet resistant thread and will have 2" wide nylon webbing sewn around the perimeter to provide additional strength.

The cover will be secured to the top primarily with Velcro. Additionally, the cover shall be secured to the front body flange with quarter-turn fasteners. A weighted flap will be furnished on the rear of the cover with two (2) bungee cords.

The cover will be red in color.

ROLL-UP DOORS

Roll-up doors will be provided on all compartments. The roll-up doors will be constructed from aluminum extruded slats which will have a flexible seal between each slat for proper sealing of the door.

A synthetic rubber seal will be provided at each side, top and bottom edge of the door to prevent entry of dirt into the compartment.

The door will be equipped with a lift bar style latch mechanism which will latch at the bottom of the door mounting extrusion.

The roll-up door assembly will be furnished with a spring-loaded, counter balance assembly to assist in door actuation.

All running board and high side compartments will be equipped with roll-up doors.

AMDOR ROLL-UP DOORS

The roll-up doors will be Amdor brand roll-up doors. The doors will be painted to match the required color of the fire department.

SWEEP-OUT COMPARTMENT FLOORS

Compartment floors will be welded to the compartment walls and have a sweep out design for easy cleaning.

Compartments with hinged doors will have the door opening flanges bend down to produce the sweep-out design.

Compartments with roll-up style doors will have the external floor flange stepped down, 1/2" high x 2" deep, to produce a sealing surface for the roll-up doors below the compartment floor. The sweep out design will also permit easy cleaning.

COATED FASTENERS

All exterior fasteners will be coated stainless steel screws. Screw threads will be coated with reusable, self-locking, sealing material to provide vibration resistance. Screw heads will be coated with a sealing element to prevent galvanic corrosion between dissimilar metals. Non-coated screws will only be provided as part of vendor supplied component installations.

COMPARTMENT LOUVERS

Ventilation between compartments to atmosphere will be provided and located to avoid water entry into compartments.

ACCESS PANELS

Removable access panels will be provided (if applicable) to access fuel tank sender, electrical junction compartment and rear body mounts.

Protective panels will be located in the rear compartments providing access to the lights and associated wiring. The covers will also serve as protective covers to prevent inadvertent damage to lights or wiring from tools or equipment located in the compartment.

ZICO FOLDING ROOF ACCESS LADDER

A Zico RL-2-6 Quic-Ladder, swing out & down vehicle ladder will be provided on the right rear body corner. The ladder will store parallel to the body. A spring loaded locking handle will keep the ladder stored to the body. Releasing the lock will allow the ladder to pull out to allow for climbing at a comfortable and safe angle. The ladder will automatically latch and will not retract until the scissor lock is raised.

The standard configuration has a two-rung fold-down section and a six-rung main ladder section. All rungs are cast aluminum with a flat nonskid surface for traction and safety. Handrails will be 1 1/4" heavy walled aluminum tubing, covered between rungs by a ribbed black neoprene tubing, which provides a firm gripping surface.

BODY RUB RAILS

Sacrificial aluminum tread plate rub rails will be mounted at the base of the body, extend outward a minimum 3/4", downward 2" and flange inward 1". The rub rails will extend the full length of the main body and extend to the rear step or wrap around the rear body corners. Rub rails will 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 will be fabricated of 3/16" polished aluminum tread plate. The outside edge on each step will be fabricated with a double break, return flange. The steps will be rigidly reinforced with a heavy duty support structure. The running boards will not form any part of the compartment design, and will be bolted into place with a minimum 1/2" clearance gap between any panel to facilitate water runoff.

OFFICER SIDE RUNNING BOARD STORAGE WELL

A storage well, constructed of 1/8" aluminum, will be recessed into the officer's side running board. The storage well will measure 9" deep x 9" wide x as long as possible between the running board support members. Drain holes will be located in the bottom corners to allow water to drain from the storage well.

The storage well shall "float" in place so as not to become damaged if struck while the apparatus is moving.

OFFICER'S SIDE WELL - HOSE CAPACITY

The officer's side storage well will have the desired capacity of:

- 50' of 5" LDH hose

DRIVER SIDE RUNNING BOARD STORAGE WELL

A storage well, constructed of 1/8" aluminum, will be recessed into the driver's side running board. The storage well will measure 9" deep x 9" wide x as long as possible between the running board support members. Drain holes will be located in the bottom corners to allow water to drain from the storage well.

The storage well shall "float" in place so as not to become damaged if struck while the apparatus is moving.

DRIVER'S SIDE WELL - HOSE CAPACITY

The driver's side storage well will have the desired capacity of:

- 50' of 5" LDH hose

INTERMEDIATE REAR STEP

An eight (8) inch deep, bolt on intermediate rear step, fabricated from 3/16" aluminum tread plate, will be installed. The step will be approximately 8" deep x 48" wide.

GRAB RAILS

All hand rails will be 1-1/4" outer diameter, knurled bright anodized aluminum extrusion, designed to meet NFPA 1901 requirements.

Molded gaskets will be installed between the handrail stanchion castings and body surfaces to prevent electrolytic reaction between dissimilar metals and to protect paint.

GRAB RAIL LOCATIONS:

Grab rails will be provided at the following specified locations. Additional grab rails will be provided adjacent to any additional steps specified to comply with NFPA 1901.
Two (2) vertical rails will be mounted on the rear edge of the body, one (1) each side.

One (1) horizontal, full width handrail will be installed on the rear, below the level of the hose bed.

FOLDING STEP(S) - BODY REAR DRIVER SIDE

No folding steps will be provided in this location.

FOLDING STEP(S)- BODY REAR OFFICER SIDE

Innovative Controls large lighted folding step(s), with a textured chrome plate finish, will be provided on officer side body rear to provide NFPA compliant access (maximum 18" height between steps) to an upper horizontal walking surface (compartment cap, dunnage area, fabricated step, or upper body compartments).

SAFETY SIGN(S) AT REAR STEP AND CROSS WALKWAY(S)

Safety sign(s) will 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.

REAR MUD FLAPS

Heavy duty mud flaps will be provided behind the rear wheels.

REAR TOW EYES

Two (2) painted tow eyes will be furnished on the rear of the vehicle. The tow eyes will be made from plate steel and will be bolted directly to the chassis frame rails with grade 8 bolts and will extend below the body. The tow eyes will be smooth and free from sharp edges, and have a minimum eyelet hole of 2-1/2". The tow eyes will be painted.

WINCH RECEIVER POINT - EACH SIDE OF THE BODY

A 2" square receiver point will be provided beneath the rub rail toward each side of the body for a portable winch. The receiver point will be a 2 1/2" x 2 1/2" x 1/4" full width of body seamless steel tube welded and gusseted to 3" x 1 1/2" steel channel directly bolted to four points on the chassis

frame rails. A 12V electrical connection with a quick disconnect compatible with the portable winch will be provided adjacent to the receiver point. A plastic end cap will be provided for the quick disconnect.

******120/240 VOLT A.C. ELECTRICAL AND GENERATOR SECTION ******

120/240 VOLT ELECTRICAL SYSTEM TESTING

All line voltage wiring and permanently connected devices and equipment will be subjected to a dielectric voltage withstand test of 900 volts for one minute. The test will be conducted between live parts and the neutral conductor and between live parts and the vehicle frame with any switches in the circuits closed. The test will be conducted after all bodywork has been completed. The dielectric tester will have a minimum 500 VA transformer with a sinusoidal output voltage that can be verified.

Electrical polarity verification will be made of all permanently wired equipment and receptacles to determine that connections have been properly made.

OPERATIONALTESTING

The apparatus manufacturer will perform the following operation test and will certify that the power source and any devices that are attached to the line voltage electrical system are properly connected and in working order.

The generator will be started from a cold start condition and the line voltage electrical system will be loaded to 100 percent of the nameplate voltage rating.

The following items will be monitored and documented every 15 minutes:

- The cranking time until the generator starts and runs.
- The voltage, frequency, and amperes at continuous full rated load.
- The generator oil pressure, water temperature, transmission temperature, hydraulic temperature, and the battery rate charge, as applicable.
- The ambient temperature and altitude.

The generator will operate at 100 percent of its nameplate wattage for a minimum of two (2) hours.

HYDRAULIC DRIVEN GENERATOR

The generator system will be an Onan model RBAB 10000 GenSet, PTO/Hydraulic, rated at 10,000 watts, 83/42 amps @120/240 VAC, single phase generator. The generator will maintain a 60 Hz frequency between 850 and 3000 rpm.

The generator will consist of hydraulic motor, alternator, cooling fan and a heat exchanger in a stainless steel housing. The reservoir will be a 3-gallon hydraulic tank with an integral filter, gauge, temperature switch, breather and fill port.

The Onan limited warranty covers virtually everything except routine maintenance for the first five (5) years or the first 1000 hours of operation.

120/240 VOLT WIRING

The generator output conductors will be 8 gauge and the output conductors will be routed through non-metallic conduit 3/4" in diameter.

120/240 VOLT DISPLAY

The digital Onan display will be by FRC and will display Hz, voltage, amperage, oil temperature and hours. The meter will be installed near the breaker panel.

GENERATOR PTO

A hot shift PTO will be provided on the transmission for the Onan generator. The PTO will be controlled from the cab. The control will include a PTO engagement switch and a PTO engaged indicator light.

GENERATOR WARRANTY

The specified generator will have a five (5) year or one thousand (1000) hour warranty as provided by the generator manufacturer. A copy of the generator warranty will be provided at time of delivery.

LINE VOLTAGE ELECTRICAL SYSTEM CERTIFICATION

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 the required line voltage section of NFPA.

GENERATOR LOCATION

The generator will be mounted above the pump enclosure in the center.

Locating the generator greater than 144" from the main breaker panel may require the installation of an additional power disconnecting means.

120/240 VOLT LOAD CENTER

The generator output line conductors will be wired from the generator output connections to a Square D, model #QO112L125G breaker panel. The breaker panel will be equipped with a properly sized main breaker using two (2) of the twelve (12) spaces which leaves a total of ten (10) available spaces.

The generator output conductors will be sized to 115% of the main breaker rating and will be installed as indicated in the wiring section.

Ten (10) appropriately sized, 120 volt, circuit breakers will be provided.

The breaker panel will be located on the rear wall of the driver side front compartment.

120/240 VOLT WIRING METHODS

Wiring/conduit will not be attached to any chassis suspension components, water or fuel lines, air or air brake lines, fire pump piping, hydraulic lines, exhaust system components or low voltage wiring.

All wiring will be installed at a minimum of 12 inches away from any exhaust piping and a minimum of 6 inches from any fuel lines.

All wiring will be securely clamped within 6 inches of any junction box and at a minimum of every 24 inches of run. All supports will be of nonmetallic material or corrosion protected metal. All supports will not cut or abrade conduit or cable and will be mechanically fastened to the vehicle.

All power supply assembly conductors, including neutral and grounding conductors, will have an equivalent amperage rating and will be sized to carry not less than 115% of the main breaker rating.

All Type SO or Type SEO cable not installed in a compartment will be installed in wire loom. Where Type SO or Type SEO cable penetrates a metal surface, a rubber or plastic grommet or bushing will be provided.

The installation of all 120/240 wiring will meet the current NFPA-1901 Standards .

120/240 VOLT WIRING IDENTIFICATION

All line voltage conductors located inside the main breaker panel box will be individually and permanently identified. When pre-wiring for future power wiring installations, the non-terminated ends will be labeled showing function and wire size.

120/240 VOLT GROUNDING

The neutral conductor of the power source will be bonded to the vehicle fame only at the power source.

The grounded current carrying conductor (neutral) will be insulated from the equipment grounding conductors and from the equipment enclosures and other grounded parts. The neutral conductor will be colored white or gray.

In addition to the bonding required for the lower voltage return current, each body and driving/crew compartment enclosure will be bonded to the vehicle frame by a copper conductor. The conductor will have a minimum amperage rating of 115 percent of the name plate current rating of the power source specification label.

120/240 VOLT CIRCUIT BREAKER / RECEPTACLE INSTALLATION

The system will be installed by highly qualified electrical technicians to assure the required level of safety and protection to the fire apparatus operators. When multiple circuit are required, the circuits will be wired to the breaker panel in a staggered configuration to minimize electrical loads on each breaker or generator (leg) circuit. The wiring, electrical fixtures and components will be to the highest industry quality standards available on the domestic market. The equipment will be the type as designed for mobile type installations subject to vibration, moisture and severe continuous usage.

120/240 VOLT RECEPTACLE INSTALLATIONS

Any receptacle installed in a wet location must be a minimum of 24 inches above the ground and provided with an approved wet location cover. Wet receptacles may not be mounted at more than 45 degrees from vertical, nor can they be mounted in a face-up position.

Four (4) 120 volt, NEMA 5-15, 15 amp, duplex straight blade receptacle with a grey thermoplastic, corrosion resistant, weatherproof cover will be installed as directed...

One (1) in the driver side front compartment
One (1) in the driver side rear compartment
One (1) in the officer side front compartment
One (1) in the officer side rear compartment

The receptacle(s) will require 15 amp, 120 volt circuit breaker(s) to be installed in the load center to properly protect the four (4) receptacle(s).

ELECTRIC CABLE REELS

Two (2) Hannay Model #ECR-1618-17-18, 120 volt, electric rewind cord reels will be provided and wired to the breaker panel. The reels will be securely mounted and equipped with a rewind control adjacent to the reel.

The cord reels will be mounted above the pump enclosure with one (1) on the driver side and one (1) on the officer side.

The circuit breaker used to protect any device attached to the cord reel will be sized to the smallest electrical connection used.

One (1) reel rewind switch(s) will be provided on the compartment wall

One (1) Hannay 4-way stainless steel roller assembly will be provided. The roller assembly opening will be the full width of the reel drum.

One (1) cable ball stop(s) will be installed on the cable to keep the end from passing through the roller assembly.

ELECTRIC CABLE

Two hundred-fifty (250) feet of Type SO yellow 12/3 heavy duty electric cable will be provided on each of the reels.

JUNCTION BOX (ES)

Two (2) Circle-D Model #PF51GFCI-5, four (4) outlet junction box(es) with one (1) NEMA 5-20R GFCI rated straight blade receptacle and three (3) NEMA L5-20R straight blade receptacles direct wired on the end of the cable will be provided.

Two (2) holder(s) constructed from 1/8" aluminum tread plate will be provided for each cord reel(s) junction box. The location of the holder will be adjacent to the cord reel roller assembly or as directed by the fire department.

WILL-BURT VERTICAL LIGHT TOWER

A Will-Burt, model 6-20, VRT-1380 SPC, vertical mast light tower will be provided and mounted as specified.

The light tower will be equipped with six (6) 230-watt, 120-volt Spectra LED spot/flood light fixtures to provide a total of 1,380 watts and 120,000 lumens of lighting. The light tower uses an RCP (Remote Control Positioner) attached to the end of the mast to allow full rotation and independent tilt (Dual Tilt) of the right and left light banks at any vertical height to ensure total scene coverage in two separate directions. The light tower extends to a maximum height of twenty feet (20') from the mounting base and auto stows to a maximum height of 84.5" from the mounted surface. A 12 volt vertical look-up light will be provided on the light tower to automatically illuminate the operational envelope of the mast.

The six (6) 230-watt light heads will require one (1) 120-volt, two pole 20-amp circuit breaker.

The light towers functions including "auto stow," are operated by a pistol grip remote control. The light tower control will be mounted in the proximity of the electrical breaker panel.

An emergency stop button will be integrated into the wired hand held control for added safety.

The light tower will be mounted in the dunnage area.

LADDER STORAGE

The ground ladders will be stored horizontally within a sleeve in the water tank.

To secure the ground ladders, a hinged rear access door will be provided and tied into the "Do Not Move Apparatus" warning system.

GROUND LADDERS

The following Alco-Lite ground ladder complement will be provided:

- One (1) Alco-Lite model PEL-24; 24', aluminum, two (2) section extension ladder will be provided.
- One (1) Alco-Lite model PRL-14; 14', aluminum, straight roof ladder with folding hooks will be provided.
- One (1) Alco-Lite model FL-10; 10', folding, aluminum, attic ladder will be provided.

****** PIKE POLES AND HOLDERS ******

PIKE POLE STORAGE

Four (4) pike pole tube(s) will be provided. Each holder will be accessible from the rear of the apparatus. Each pike pole holder will be labeled to indicate the pike pole length.

The pike pole tube(s) will be mounted in the suction hose storage compartment.

- One (1) 6' Fire Hooks Unlimited fiberglass handled pike pole(s) will be provided.
- Two (2) 8' Fire Hooks Unlimited fiberglass handled pike pole(s) will be provided.
- One (1) 10' Fire Hooks Unlimited fiberglass handled pike pole(s) will be provided.

SUCTION HOSE STORAGE

The suction hoses will be located beneath the hose bed, one (1) on the driver side and one (1) on the officer side. The hose storage area will be accessed from the rear of the apparatus. The storage area will be enclosed with a hinged door on the rear of the body that will be tied into the "Do Not Move Apparatus" warning system.

Note: On bodies with roll up style doors this storage area will be behind the roll of the door and will not affect usable compartment space. On bodies with hinged style doors this storage area will be in the top corner of the compartment.

SUCTION HOSE

Two (2) 12 foot sections of six (6) inch PVC lightweight suction hose will be furnished (Kochek or Firequip Maxi-Flex). Suction hose will be for suction only and not to be used on pressurized hydrants or for relay pumping. Couplings will include a long handle, female swivel on one end and a rocker lug male on the other end. All threads will be six (6) inch N.S.T.

SUCTION HOSE

Two (2) 12' sections of three (3) inch Maxi-Flex (PVC) suction hose with lightweight couplings will be furnished. Couplings will include a female swivel on one end and a rocker lug male on the other end. All threads will be **2 1/2 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.

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.

EQUIPMENT CLARIFICATION

The NFPA-1901 required suction strainer will "NOT" be provided by the apparatus manufacturer.

STRAINER

One (1) 6" NST, Red Head 140-60001 barrel type strainer(s) will be provided to attach to the suction hose. A compartment mounting bracket will also be provided to store the strainer(s) when not in use.

EQUIPMENT CLARIFICATION

The NFPA-1901 recommended double female hydrant adapter will not be provided by the apparatus manufacturer.

EQUIPMENT CLARIFICATION

The NFPA-1901 recommended double female hydrant adapter will 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 will be provided and shipped loose with the completed apparatus at the time of delivery:

WHEEL CHOCKS

Two (2) ZICO #SAC-44 folding wheel chocks will be mounted forward of the rear wheels on the driver side below the side running board compartments.

****** PAINT SECTION ******

PAINT, PREPARATION AND FINISH

The apparatus body will be painted Sikkens [#COL]. The paint process will meet or exceed current state regulations concerning paint operations. Pollution control will include measures to protect the atmosphere, water, and soil. Contractor will, upon demand, provide evidence that the manufacturing facility is in compliance with State EPA rules and regulations.

The exterior will have no mounted components prior to painting to assure full coverage of metal treatments and paint to the exterior surfaces of the body. Any vertically or horizontally hinged smooth-plate compartment doors will be painted separately to assure proper paint coverage on body, door jambs and door edges.

Paint process will feature Sikkens high solid LV products and be performed in the following steps:

- Corrosion Prevention - all aluminum surfaces will be pre-treated with the Alodine 5700 conversion coating to provide superior corrosion resistance and excellent adhesion of the base coat.

- Sikkens Sealer/Primer LV - acrylic urethane sealer/primer will be applied to guarantee excellent gloss hold-out, chip resistance and a uniform base color.

- Sikkens High Solid LVBT650 (Base coat) - a lead-free, chromate-free high solid acrylic urethane base coat will be applied, providing excellent coverage and durability. A minimum of two (2) coats will be applied.

- Sikkens High Solid LVBT650 (Clear coat) - high solid LV clear coat will be applied as the final step in order to ensure full gloss and color retention and durability. A minimum of two (2) coats will be applied.

Any location where the material is penetrated after painting, for the purpose of mounting steps, hand rails, doors, lights, or other specified components will be treated at the point of penetration with a corrosion inhibiting pre-treatment (ECK Corrosion Control). The pre-treatment will be applied to the aluminum sheet metal or aluminum extrusions in all locations where the aluminum has been penetrated. All hardware used in mounting steps, hand rails, doors, lights, or other specified components will be individually treated with the corrosion inhibiting pre-treatment.

After the paint process is complete, the gloss rating of the unit will be tested with a 20 degree gloss meter. Coating thickness will be measured with a digital MIL gauge and the orange peel with a digital wave scan device.

BODY PRIMER & PREPARATION

All exposed welds will be ground smooth for final finishing of areas to be painted. The compartments and doors are totally degreased and phosphatized. After final body work is completed, grinding (36 and 80 grit), and finish sanding will be used in preparation for priming.

BODY FINISH PAINT

The body will be finish sanded and prepared for final paint. Upon completion of final preparation, the body will be painted utilizing the highest quality, state of the art, low V.O.C., polyurethane base paint. Finish paint will be applied in multiple coats to ensure proper paint coverage with a high gloss finish.

The entire body will be buffed and detailed.

BODY PAINT

The inside and underside areas of the complete body assembly will 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 will 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 will 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 will be painted black.

FENDER STORAGE COMPARTMENT PAINT

The interior of the fender storage compartments (if fender compartments are specified) will be finish painted job color.

CAB PRIMER & PREPARATION

The cab primer will be a two (2) stage process. First stage will be a coating with a two part component, self etching, corrosion resistant primer to chemically bond the surface of the metal for increased adhesion. Second stage will be multiple coats of a catalyzed, two component polyurethane, primer applied for leveling of small imperfections and top coat sealing.

CAB FINISH PAINT

The entire cab will be finish sanded and prepared for final paint. Upon completion of final preparation, the cab will be painted utilizing the highest quality, state of the art, low V.O.C., polyurethane base paint. Finish paint will be applied in multiple coats to ensure proper paint coverage with a high gloss finish.

The cab exterior will be finish painted with Sikkens paint system, single color, to match purchaser's furnished paint code.

The entire exterior finish of the cab will be buffed and detailed.

CAB INTERIOR PAINT

The interior metal surfaces of the cab will be finish painted with a textured gray paint.

CHASSIS PAINT

The chassis frame rails, suspension, axles, and drivelines (with the exception of any PTO drivelines which will be safety yellow) will be painted black with a polyurethane base paint prior to installation of any air lines or electric systems to ensure proper serviceability.

PAINT CODES

The paint will match customer furnished paint code and layout. The paint code will be as indicated below:

- **PRIMARY PAINT COLOR**

  Single Color: TBD *Paint Code# TBD*

TOUCH-UP PAINT

One (1) pint of each exterior color paint for touch-up purposes will be supplied when the apparatus is delivered to the end user.

FINALIZATION & DETAILING

Prior to delivery the vehicle, the interior and exterior be cleaned and detailed. The finalization process detailing will include installation of NFPA required labels, checking fluid levels, sealing and caulking required areas of the cab and body, rust proofing, paint touch-up, etc.

RUST PROOFING

The entire unit will be thoroughly rust proofed utilizing rustproof and sound deadening materials applied in manufacturer recommended application procedures. Rust proofing will be applied during the assembly process and upon completion to insure proper coverage in all critical areas.

****** LETTERING AND STRIPING ******

COMPUTER GENERATED LETTERING

The lettering and striping will be custom designed utilizing state of the art computer software and computerized cutting machines. The manufacturer will 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 will 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 will be provided on the cab driver's and officer's doors per the fire department requirements. The design of the lettering on the cab doors will be designed to fit in the 496 sq. inches available.

Lettering provided on the driver's and officer's cab doors will be 3" high.

REAR CAB DOOR LETTERING

Gold leaf, "Sign Gold", with drop shadow lettering will be provided on the cab crew doors per the fire department requirements. The design of the lettering on the cab doors will be designed to fit in the 496 sq. inches available.

Lettering provided on the crew cab doors will be 3" high.

CAB SIDE PANEL LETTERING

Gold leaf, "Sign Gold", with drop shadow lettering will be provided on the cab side panel per the fire department requirements. The design of the lettering on the cab side panel will be designed to fit in the 150 sq. inches available.

Lettering provided on the cab side panel will be 3" high.

REAR BODY LETTERING

Gold leaf, "Sign Gold", with drop shadow lettering will be provided on the rear body panel per the fire department requirements. The design of the lettering on the rear of the body will be designed to fit in the 167 sq. inches available.

Lettering provided on the rear body panel will be 3" high.

BODY SIDE SHEET LETTERING

Gold leaf, "Sign Gold", with drop shadow lettering will be provided on the body side sheet per the fire department requirements. The design of the lettering on the body side sheet will be designed to fit in the 2500 sq. inches available.

Lettering provided on the body side sheet will be 6" high.

LETTERING FONT

The lettering will be designed and cut with a basic block type font:

"BLOCK TYPE FONT"

CUSTOM FIRE DEPARTMENT LOGO

A pair of custom fire department logos will be computer generated and will be no larger than the 496 sq. inches available.

The custom logo will be printed on Scotch-Cal with two computer generated printed colors.

The custom logo will be located as directed by the Fire Department.

****** NFPA REQUIRED SCOTCH-LITE STRIPING ******

SCOTCH-LITE STRIPE

A ten (10) inch high "Scotch-Lite" stripe will be provided. The stripe will be applied on a minimum of 60 percent of each side of the unit, 60 percent on the rear of the unit and 40 percent on the front of the unit. The Scotch-Lite stripe layout will be determined by the Fire Department.

The Scotch-Lite will be white in color.

REAR CHEVRON STRIPING

At least 50% of the rear facing vertical surface will be covered with alternating strips of reflective striping.

The striping will be 6" Scotch-Lite.

The Scotch-Lite will 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, which ever 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 two (2) year parts and labor warranty. The wheel seals, gaskets and wheel bearings shall have a one (1) year warranty. A copy of the manufacturer's warranty shall be supplied to define additional details of the warranty provisions.

WARRANTY - REAR AXLE

The Meritor axle/s shall be furnished with a two (2) year parts and labor warranty. The wheel seals, gaskets and wheel bearings shall have a one (1) year warranty. A copy of the manufacturer's warranty shall be supplied to define additional details of the warranty provisions.

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

Waterous warrants, to the original Buyer only, that products manufactured by Waterous shall be free from defects in material and workmanship under normal use and service for a period of five (5) years from the date the product is first placed in service or five and one-half (5 1/2) years from the date of shipment by Waterous, whichever period shall be the first to expire; provided the buyer notifies Waterous, in writing, of the defect in said product within the warranty period, and said product is found by Waterous to be nonconforming with the aforesaid warranty.

WARRANTY - CLASS 1 - PRODUCTS

Class 1 warrants that any equipment of our own manufacture (or manufactured for us pursuant to our specifications) found to have defects in material or workmanship during normal use and service, shall be repaired or replaced (at our opinion) free of charge, provided that written notice of such defect is received by us within two (2) years, (three 3 years on liquid filled gauges) after initial shipment.

WARRANTY - FOAM SYSTEM

Waterous warrants the original buyer only, that products and parts manufactured by Waterous shall be free from defects in material and workmanship under normal use and service for a period of two (2) years from the date the product is first placed in service or two and one-half years from the date of shipment by Waterous, whichever comes first.

WARRANTY - AKRON PRODUCTS

The limited warranty set forth here against defective materials or workmanship for a period of five (5) years shall be given by Akron Brass Co. with respect to Akron Brass Co. products purchased and used in the United States and Canada respectively. All Akron valves are warranted for 10 years.

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.

WARRANTY - GENERATOR

The specified generator shall have a five (5) year or one thousand (1000) hour warranty as provided by the generator manufacturer. A copy of the generator warranty shall be provided at time of delivery.

WARRANTY LOCATION

All possible warranty work shall be performed at the buyer's fire station when possible. If the apparatus must return to the service center then the successful bidder shall supply drivers to transport the vehicle to and from at no additional charge to the Fire District.

EQUIPMENT MOUNTING ALLOWANCE

An equipment mounting allowance in an amount of 10,000.00 has been included in this proposal. The allowance will provide either purchased or custom manufactured mounting hardware, to provide mounting of Fire Department or proposed equipment on the completed unit.

All of the equipment mounting requirements will be detailed to the manufacturer at or near the time of the final inspection. Any required modifications to existing components or accessories will be charged to this allowance. The manufacturer will maintain a detailed summary of all labor and materials applied to meet the Fire Department requirements and upon completion, will either provide a credit to the Department for labor and materials not consumed by this project or a secondary invoice will be submitted to the Fire Department for all expenditures, which are over and above the original allowance.

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 IAA 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 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.
5.8.3.4 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.

Non-Collusive Agreement

The Non-Collusion Statement MUST be completed and included within the AFD Fire Aparatus Bid package submitted to the Village of Altamont.

Village of Altamont NON-COLLUSION AFFIDAVIT

I, _____ residing in

_____

in the County of _____ and

State of _____

of full age, being duly sworn according to law on my oath and say that:

I am _____ of the firm of
(title)

_____
(name of firm)

the bidder making this Proposal for the bid proposal

entitled_____;

that I executed the said proposal with full authority to do so; that said bidder has not, directly or indirectly entered into any agreement, participated in any collusion or otherwise taken any action in restraint of free, competitive bidding in connection with the above named project; and that all statements contained in said proposal and this affidavit are true, correct, and made with full knowledge that the Village of Altamont relies upon the truth of the statements contained in said Proposals and in the statements contained in this affidavit in awarding the contract for the said project.

I further warrant that no person or selling agency has been employed or retained to solicit or secure such contract upon an agreement or understanding for a commission, percentage, brokerage, or contingent

fee, except bona fide employees or bona fide established commercial or selling agencies.

Signature:_____

Subscribed and sworn to before me this_____ day of _____, 20____

Print Name of Affiant:_____

Notary Public of _____

My commission expires_____

IRAN DIVESTMENT ACT OF 2012 CERTIFICATION

The Iran Divestment Act of 2012 (Act), is codified in State Finance Law (section 165-a) and General Municipal Law (section 103-g). The Act prohibits political subdivisions from considering any person or entity engaging in investment activities in the energy sector in Iran as a responsible bidder or proposer. Attached is the link to the Prohibited Entities list on the OGS website: http://www.ogs.ny.gov/about/regs/docs/ListofEntities.pdf.

A bid or proposed shall not be considered for award nor shall any award be made where the bidder or proposer fails to submit a signed and verified bidder's certification.

Each bidder or proposer must certify that it is not on the list of entities engaged in investment activities in investment activities in Iran created pursuant to State Finance Law (section 165-a). In any case where the bidder or proposer cannot certify that they are not on such list, the bidder or proposer shall so state and shall so furnish with the bid or proposal a signed statement which sets forth in detail the reasons why such statement cannot be made.

The Village of Altamont may, but is not required to, award to a bidder or proposer who cannot make the certification if:

a. The investment activities in Iran predate the effective date of this law (April 12, 2012), have not been expended or renewed since, and the bidder or proposer has adopted, publicized, and is implementing a formal plan to cease such activities and refrain from any new investments in Iran.
b. The Village of Altamont determines that the goods and services provided by the bidder or proposer are necessary to its functions, and without an exemption it would be unable to obtain the goods or services.

By submission of this bid or proposal, the bidder or proposer and each person signing on behalf of any bidder or proposer certifies, under penalty of perjury, that to the best of its knowledge and belief, that to the best of its knowledge and belief, that the bidder or proposer is not on the list created pursuant to State Finance Law.

Company Name of Respondent: _____

Address: _____

City/State/Zip Code: _____

Telephone Number: _____

Fax Number: _____

Email: _____

Authorized Agent:

Name: _____
(Printed)

Title: _____
(Printed)

By: _____
(Signature)

SUBSCRIBED AND SWORN to before me by the above name on this _____day of _____, 20___.

_____
Notary Public in and for the

State of_____