

**SPECIFICATIONS**

**FOR THE**

**MIDDLE GROVE**

**FIRE COMPANY**

**June 2015**

INTRODUCTION

# MIDDLE GROVE FIRE COMPANY

**Bidder  
Complies**

**Yes**

**No**

## 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, aerial device, fire pump and related components, water tank, fire body, electrical components, painting, and equipment. In evaluating the bid proposals to determine which proposal is the most advantageous, these major items shall be considered.

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

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

### BID COMPLIANCE INSTRUCTIONS

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

The Middle Grove 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.

# MIDDLE GROVE FIRE COMPANY

**Bidder  
Complies**

**Yes      No**

**FIRE APPARATUS DOCUMENTATION**

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

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

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

If the apparatus has a fire pump or an industrial supply pump, the pump manufacturer's certification of suction capability.

If the apparatus has a fire pump or an industrial supply pump, a copy of the apparatus manufacturer's approval for stationary pumping applications.

If the apparatus has a fire pump or an industrial supply pump, the engine manufacturers certified brake horsepower curve for the engine furnished, showing the maximum governed speed.

If the apparatus has a fire pump or an industrial supply pump, the pump manufacturers certification of hydrostatic test.

If the apparatus has a fire pump or an industrial supply pump, the Underwriters Laboratory certification of inspection and test for the fire pump (if applicable).

If the apparatus has an aerial device the Underwriters Laboratory certification of inspection and test for the aerial device.

If the apparatus has an aerial device, all the technical information required for inspections to comply with NFPA 1911, Standards for Testing Fire Department Aerial Devices.

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

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**Bidder  
Complies**

**Yes      No**

If the apparatus is equipped with an air system, test results of the air quality, the SCBA fill station, and the air system installation.

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.

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

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

## **VEHICLE RECORDS**

The successful bidder shall be responsible for preparing and maintaining a record file of parts and assemblies used to manufacture the apparatus. These records shall be maintained in the factory of the bidder for a minimum of twenty (20) years. File shall contain copies of any and all reported deficiencies, all replacement parts required to maintain the apparatus, and original purchase documents including specifications, contract, invoices, incomplete chassis certificates, quality control reports and final delivery acceptance documents. The Middle Grove Fire Department shall have access to any and all documents contained in this file upon official written request.

## **BIDDER INSTRUCTIONS**

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

Each bid shall be accompanied by a detailed description of the apparatus and equipment it proposes to furnish. It is the intent of these specifications to cover the furnishing and delivery of a complete and soundly engineered apparatus equipped as specified. Minor details of construction and materials, where not otherwise specified, are left to the discretion of the contractor, who shall be solely responsible for the design and construction of all features.

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

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

## **TIMELY PROPOSALS**

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

# MIDDLE GROVE FIRE COMPANY

**Bidder  
Complies**

**Yes      No**

## 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 fire fighting service. All parts of the apparatus shall be strong enough to withstand general service under full load. The apparatus shall be so designed that the various parts and readily accessible for lubrication, inspection, adjustment and repair. Bidder's specifications must meet minimum requirements of N.F.P.A. Pamphlet #1901; Underwriters Laboratories, Inc.; and all State and Federal Department of Transportation vehicle regulations at time of sale of unit.

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

## PRODUCT LIABILITY INSURANCE

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

## SINGLE-LINE RESPONSIBILITY

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

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

Yes/No: \_\_\_\_\_

## ADDENDA AND INTERPRETATIONS

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

## 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.

# MIDDLE GROVE FIRE COMPANY

**Bidder  
Complies**

**Yes      No**

## SERVICE CENTER AND PARTS DEPOT

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

## SERVICE CENTER INFORMATION

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

## SPECIAL CONDITIONS

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

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

## PRICES AND PAYMENTS

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

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

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

## 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 where as 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.

## 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.

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**Bidder  
Complies**

**Yes      No**

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

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

## **PERFORMANCE BOND**

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

## **FAIR, ETHICAL AND LEGAL COMPETITION**

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

## **NON-COLLUSIVE BIDDING CERTIFICATION**

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

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

## **USER'S LIST**

Each bidder shall include a current "User's List" with a minimum of five (5) units that are within 250 miles of the purchaser. This list shall include customer name, person to contact, address and telephone number. Failure to include this list shall result in rejection of the bid.

## **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.

## **SALES ENGINEER**

The successful bidder shall designate an individual to perform the contractor's sales engineer functions. The sales engineer shall provide a single point interface between the purchaser and the contractor on all matters concerning the contract.

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**Bidder  
Complies**

**Yes**

**No**

**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 suction, 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 three (3) factory inspection trips to the apparatus manufacturer's facility. Transportation, meals, lodging, and other requisite expenses shall be the bidder's responsibility.

Accommodations will be for five (5) Fire Department representatives per trip.

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

- Pre-construction / blueprint review.
- Midpoint completion of entire apparatus.
- Final inspection upon completion.

Travel arrangements less than 300 miles from the manufacturing facility shall be via ground transportation.

The Middle Grove 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 Middle Grove Fire Department.

During inspection visits, the Middle Grove 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 Middle Grove 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.

**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.



# MIDDLE GROVE FIRE COMPANY

**Bidder  
Complies**

**Yes      No**

The manual shall contain the following:

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

## **VEHICLE FLUIDS PLATE**

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

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

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

## **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:           \_\_437\_\_ "
- OVERALL WIDTH:           \_\_100\_\_ "
- OVERALL HEIGHT:           \_\_120\_\_ "
- WHEELBASE:                \_\_233\_\_ "

# MIDDLE GROVE FIRE COMPANY

**Bidder  
Complies**

**Yes      No**

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.: \_\_\_\_\_22500\_\_\_\_\_ lbs.
- MINIMUM REAR G.A.W.R.: \_\_\_\_\_48000\_\_\_\_\_ lbs.
- MINIMUM TOTAL G.V.W.R.: \_\_\_\_\_70500\_\_\_\_\_ lbs.

## **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.

## **BIDDERS BACKGROUND**

All bidders shall state the ownership of the organization which shall actually construct the apparatus. Companies which are a division, subsidiary, wholly or partially owned subsidiary or other entity which is wholly or partially owned or controlled by another entity shall state their entire ownership lineage. Bidders from such organizations must have the bid signed by the chief executive of the parent entity.

## **PRIMARY PLANT CONSTRUCTION**

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

## **REQUIRED PROPOSAL BLUEPRINT**

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

## **BODY CONSTRUCTION LIMITATIONS**

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

## **FAMA COMPLIANCE**

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

## **U.S.A. MANUFACTURER**

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

# MIDDLE GROVE FIRE COMPANY

**Bidder  
Complies**

**Yes      No**

## QUALITY MANAGEMENT

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

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

## TABLE OF CONTENTS

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

## STEPPING, STANDING, & WALKING SURFACES

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

## AMP DRAW REPORT

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

A written load analysis, which shall include the following:

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

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

## COOPERATIVE PURCHASING

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

## UNDERWRITERS LABORATORIES INC. (UL) EXAMINATION AND TEST PROPOSAL

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

# MIDDLE GROVE FIRE COMPANY

**Bidder  
Complies**

**Yes      No**

## INDEPENDENT TESTING ORGANIZATION QUALIFICATIONS

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

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

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

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

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

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

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

## 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: \_\_\_\_\_

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**Bidder  
Complies**

**Yes      No**

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 ___ |
| Aerial Device Repairs:            | Yes ___ No ___ |
| Aerial Weldment Repairs:          | Yes ___ No ___ |
| Aerial Hydraulic System Repairs:  | Yes ___ No ___ |
| Aerial Electrical System 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 "MOBILE WATER SUPPLY"**

The unit will be designed to conform fully to the "Mobile Water Supply Fire Apparatus" requirements as stated in the NFPA 1901 Standard (2009 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 7 Mobile Water Supply 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 18 Water Tanks
  
- Chapter 20 Foam Proportioning Systems
- Chapter 22 Line Voltage Electrical Systems

# MIDDLE GROVE FIRE COMPANY

**Bidder  
Complies**

**Yes**

**No**

## 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)
- Equipment Rack Fluid (if applicable)
- Air Compressor System Lubricant
- Generator System Lubricant (if applicable)
- Front Tire Cold Pressure
- Rear Tire Cold Pressure
- Aerial Hydraulic Fluid (if applicable)
- Maximum Tire Speed Rating

### Chassis Data

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

Manufacturers weight certification:

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

# MIDDLE GROVE FIRE COMPANY

**Bidder  
Complies**

**Yes**

**No**

## ROLLOVER STABILITY

The apparatus will meet the criteria defined in 4.13.1 for rollover stability as defined in the 2009 NFPA Standard for Automotive Fire Apparatus.

## 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 \*\*\*\***

### "PREDATOR™" 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.

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

### OPEN SPACE DESIGN

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

### CAB MATERIAL - 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.

# MIDDLE GROVE FIRE COMPANY

**Bidder  
Complies**

**Yes      No**

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 - MEDIUM FOUR DOOR STYLE CAB**

The cab will be fully enclosed, capable of comfortably seating six (6) fire fighters in full fire fighting turnout gear, cab over engine design, with integral tilt mechanism and engine access on top of doghouse.

Minimum Cab Dimensions:

- Overall width 100"
- Inside width across ceiling 92"
- Front area floor to ceiling 63"
- 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) 24" (driver's side, at floor)
- Inside width (door to engine enclosure) 20-1/2" (officer's side, at floor)
- Crew seat area width 92"
- Outer crew seat risers to rear wall 42"
- Centerline front axle to back of cab 62-1/2"
- Floor to top of engine enclosure 29.5"
- Centerline axle to front of cab 74"





# MIDDLE GROVE FIRE COMPANY

**Bidder  
Complies**

**Yes**

**No**

All discharge handle openings will have sweep brushes installed to provide a seal around the handles.

## **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.

## **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 2 1/2" wide reinforced rubber strap 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 step will be a bolt-in cast aluminum step. The cab steps risers will be overlaid with bright finish aluminum tread plate.

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 upper section of the steps and respective step risers will be constructed as an integral part of the cab construction and will be overlaid with bright finish aluminum tread plate. Each lower step will be a bolt-in cast aluminum step.

## **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.

## **ELECTRIC WINDOWS**

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

All side cab doors will be equipped with electrically operated windows.

# MIDDLE GROVE FIRE COMPANY

**Bidder  
Complies**

**Yes      No**

The driver will have a control to operate the officer's side window and the rear cab windows, in a panel located on the dash. The officer side window control will be in a panel on the dash.

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

## **DOOR WINDOW TRIM**

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 an aluminum panel, full height. The panel will be 1/8" aluminum and painted with Line-X and will be designed to allow easy access to the inner door.

The Line-X will be dark gray in color.

Each interior cab door panel will be equipped with reflective ScotchLite material that will cover at least 96 in<sup>2</sup>. The material will be applied to an aluminum plate that will be fastened to the door panel.

## **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.

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

## **WINDSHIELD WIPERS AND WASHER**

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

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

Windshield washers will be electric operated wet-arm type with a 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.

**MIDDLE GROVE FIRE COMPANY**

**Bidder  
Complies**

**Yes**

**No**

# MIDDLE GROVE FIRE COMPANY

**Bidder  
Complies**

**Yes      No**

## **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.

## **DARK TINTED REAR WINDOW GLASS**

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

## **ILLUMINATED GRAB HANDLES WITH REFLECTIVE STRIPS**

Four (4) Hansen 1-1/4" diameter x 28" long, knurled, bright anodized aluminum handrails will be provided, one (1) at each cab door entrance. Each grab rail will have white LED lights that will be wired to the DOT marker lights and interlocked to illuminate when the parking brake is applied. In addition to the LED lights, each handrail will have two (2) red diamond grade reflective strips for enhanced visibility. 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:

- Three (3) 12" long, vertically mounted, one (1) on the officer's side of the cab interior "A" post and one (1) on each side of the cab interior on the "C" post in the crew area
- One (1) 11" long, horizontally mounted, on each front cab door on the interior door panel
- 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.
- One (1) 12" long, vertically mounted, one (1) on the driver's side cab interior on the "A" post.

## **FRONT CAB GRILL**

There will be a bright finished, 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 design will match the thickness of the headlights to provide a streamlined, cohesive front trim package.

# MIDDLE GROVE FIRE COMPANY

**Bidder  
Complies**

**Yes      No**

A mesh bug screen will be provided behind the front grill assembly to protect the radiator from bugs and other debris. The screen will be secured to the front of the cab, behind the main grill.

## **AIR INTAKE/OUTLET**

Two (2) bright finished, custom formed air inlets/outlets will be provided horizontally above the wheel well opening, one on each side of the cab. The grille will be designed with an aesthetic look with horizontal louvers that will be equipped with a mesh screen to serve as a secondary ember separator. The side intakes will be bolstered a minimum of 1" from the skin of the cab face. The design will permit proper ducting of air through the engine compartment and cooling system.

## **ENGINE AIR INTAKE SYSTEM**

The left side inlet, used for the air intake to the air cleaner, 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!

A mesh screen will be provided behind the side grill assembly to protect the intake from debris.

## **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.

## **VELVAC WEST COAST MIRRORS WITH 2010 HEADS and 6" CONVEX**

Two (2) Velvac West Coast style 2010 mirrors will be furnished, one 708211-4 and one 708212-4 on each front cab door. Each mirror will have a 16 x 8 flat glass head mounted in a polished 300 series stainless steel outer shell and a heavy duty ABS inner housing. Both heads will be electrically heated and motorized. The mirror heads will be installed on a one piece stainless steel loop mounted to the forward portion of the door with two (2) brackets, forward of the windows.

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

All parts for installation of the West Coast Mirrors will be supplied. Both heads will be electrically heated and controlled by switching provided by the mirror manufacturer. Both mirror heads will be controlled from the driver's seating position.

# MIDDLE GROVE FIRE COMPANY

**Bidder  
Complies**

**Yes**

**No**

## **INTERIOR CAB 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 covered with a three (3) piece custom formed ABS vinyl overlay, which will have integrated windshield defroster/heat vents and four (4) comfort vents.

All ABS formed material panels, as well as all of the interior upholstery panels will be medium gray in color. The upholstered cab overhead and side wall portions will utilize gray Durawear upholstery 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.

The material utilized for this application will be certified to meet the NFPA 1901, 2009 revision for anti slip walking surfaces.

## **CAB ACOUSTICAL INSULATION**

One (1) inch thick acoustical insulation will be provided on the cab roof and rear and side walls of the cab. This material will be fitted between the cab structural members and secured with adhesive to provide an insulation barrier for noise and heat.

## **ENGINE ENCLOSURE**

The forward portion of the engine enclosure will be covered with a custom formed ABS overlay that will be coated with Line-X 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 .250 5052-H32 aluminum, 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 1900 pamphlet.

A, 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

# MIDDLE GROVE FIRE COMPANY

**Bidder  
Complies**

**Yes      No**

latches and gas shock holders. There will be an ABS cover, that will be coated with Line-X, over the access door to give a cleaner look to the top of the engine enclosure and doghouse area.

## **SUN VISORS**

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

## **ADVANCED OCCUPANT RESTRAINT SYSTEM**

The cab will be equipped with advanced occupant restraint systems. This system will function in the event of a side roll over and will be compatible with occupants ranging from a 5<sup>th</sup> percentile female to 95<sup>th</sup> percentile male.

This system consists of a roll sensor, seat and occupant pretensioners; buckle pretensioners and inflatable side airbags. This system will be functionally active while the truck is in operation.

A hybrid or pyrotechnic inflator will inflate the side airbags. The bag should remain inflated to the extent of providing head cushioning for 10 seconds after inflation. Pretensioners should be compatible with either ABTS or body mounted seats and seat belts. Buckle pretensioners will be used on static or power seats where there is no air suspension. The buckle pretensioners must be capable of stroking 125 mm.

## **ROLL SENSOR**

The roll sensor continually monitors the roll rate and angle of the vehicle, and deploys safety devices when a roll event occurs. Deployment determination is made by a combination of vehicle angle and angular rate. Vehicle deployment angle will never exceed 60 degrees.

The roll sensor performs self-diagnostics each time the vehicle is started. A dash-mounted light will turn off after approximately 10 seconds if the sensor is functioning. During operation, the roll sensor monitors for proper connection to each safety device in the vehicle once per second. If improper connection is measured at any device or if an internal fault occurs, the roll sensor will illuminate the dash-mounted light. The system will continue to function in the event of non-critical faults. System diagnostics are on the SAE J1587 bus.

## **\*\*\*\*\* CAB SEATING & ACCESSORIES \*\*\*\*\***

### **DRIVERS SEAT**

The driver's seat will be a H. O. Bostrom Sierra FX/ABTS LH fixed high back bucket seat. The seat will have a tapered and padded seat cushion with lumbar support. A two (2) way, fore and aft seat base will be provide.

The Side Air Curtain will be mounted integral to the outboard bolster of the seat back. The air curtain will be covered by a decorative panel when in the stored position.

A suspension seat safety system will be included. When activated the system will pretension the seat belt then retract the seat to its lowest travel position.

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.

### **OFFICERS SEAT**



# MIDDLE GROVE FIRE COMPANY

**Bidder  
Complies**

**Yes      No**

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

The Side Air Curtain will be mounted integral to the outboard bolster of the seat back. The air curtain will be covered by a decorative panel when in the stored position.

A suspension seat safety system will be included. When activated the system will pretension the seat belt around the occupant to firmly hold them in place in the event of a collision.

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

The officer's seat 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 with Side Curtain Airbag. 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 Side Air Curtain will be mounted integral to the outboard bolster of the seat back. The air curtain will be covered by a decorative panel when in the stored position.

A suspension seat safety system will be included. When activated the system will pretension the seat belt around the occupant to firmly hold them in place in the event of a collision.

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

The driver's side rear facing outboard seat 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 with Side Curtain Airbag. The seat will have a tapered and padded seat cushion with lumbar support. The seat will include a SCBA storage area with integral headrest.

# MIDDLE GROVE FIRE COMPANY

**Bidder  
Complies**

**Yes      No**

The Side Air Curtain will be mounted integral to the outboard bolster of the seat back. The air curtain will be covered by a decorative panel when in the stored position.

A suspension seat safety system will be included. When activated the system will pretension the seat belt around the occupant to firmly hold them in place in the event of a collision.

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

The officer's side rear facing outboard seat 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 REAR FACING CREW SEATS**

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

Each seat will include a 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 (2) Rear facing center crew seats will have a flip-up style seat.

The center rear facing seats 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 an Akron/Weldon seat belt warning system. The system will consist of a Seat Belt module, dash mounted display and an audible alarm.

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

## **VEHICLE DATA RECORDER**

# MIDDLE GROVE FIRE COMPANY

**Bidder  
Complies**

**Yes**

**No**

An Akron/Weldon 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

## **VEHICLE DATA RECORDER DOWNLOAD HARNESS**

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

## **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.

## **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.

## **LAPTOP COMPUTER SLIDE OUT TRAY**

A slide out tray will be installed for the officer to provide an area for laptop computer usage. In the closed position this area will be nest forward to allow access in and out of the vehicle.

## **\*\*\*\*\* CAB INSTRUMENTATION & CONTROLS \*\*\*\*\***

## **DASH & CENTER CONSOLE**

The driver and officer side dash, along with the center dash, will be covered with a custom formed ABS overlay that will be coated with Line-X. The Line-X color will match the interior color of the cab to create an ergonomically designed interior to be user friendly and functional for the driver and officer.

# MIDDLE GROVE FIRE COMPANY

**Bidder  
Complies**

**Yes      No**

The dash gauge panel will be a custom formed ABS pewter gray wrap-around design for improved visibility. A full complement of gauges will be provided in custom formed bezels. The starter and ignition switches will also be integrated into the upper left portion of the gauge panel for easier access.

All warning lights and indicators will be located in either the gauge itself or in the warning light cluster located in the lower center portion of the dash. 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.

The transmission gear selector and the spring brake control valve will be located on an angled section of the center dash assembly toward the driver for easy access.

There will be provisions for mounting a switch panel in the center of the dash between the driver and officer. The top center of the dash assembly will contain one (1) removable panel to access the main chassis wiring circuits and breaker panels.

## **DRIVERS DASHBOARD PANEL**

The main instrument panel will be centered in front of the driver and will be mechanically fastened to the main dash assembly. The panel will be made of custom formed ABS that will contain the primary gauges, an instrument warning light cluster and the ignition and engine start switches.

Each gauge will have a raised glass lens with polished chrome trim ring and be backlit by integral blue LED's. Each gauge will be designed with an integral red warning light with a pre-programmed warning point. Gauges monitoring drive-train component status will be of the direct data bus type capable of displaying information broadcast on the J 1939 data-link. Each gauge warning indicator will be capable of activating an audible alarm inside the dashboard.

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

The primary gauges will consist of:

- Vehicle speedometer (0-80 mph)
  - Engine tachometer (0-3000 rpm)
  - Engine oil pressure (0-100 psi); low oil pressure warning
  - Engine coolant temperature (100-250 °F); high engine temp warning (based on engine)
  - Transmission oil temperature (100-350 °F); high transmission fluid temp warning
  - Vehicle battery voltage (9-18 VDC); low voltage warning at 11.8 amps
  - Front air system gauge (0-150 psi); low air pressure warning at 65 psi
  - Rear air system gauge (0-150 psi); low air pressure warning at 65 psi
  - Fuel level (E-1/2-F); low fuel level warning @ 1/8 tank
  - Air cleaner restriction gauge (0 - 40), warning at 25" restriction.
- 
- Inter axle lock control switch
  - Diesel Exhaust Fluid level (E-1/2-F); low fuel level warning @ 1/8 tank
  - Engine Compression Brake Controls

## **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.

**MIDDLE GROVE FIRE COMPANY**

**Bidder  
Complies**

**Yes**

**No**

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**Bidder  
Complies**

**Yes      No**

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 LED's. 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)

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**Yes      No**

- "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)
- "4x4" (green 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).
  
- "Inter Axle Lock" indicator
  
- "ATC Disabled" indicator (red in color)
  
- "ATC Active" indicator (yellow in color)

**LOWER LEFT AUXILIARY SWITCH PANEL**

The driver's lower left 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 override, 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. This control will be equipped with a mechanical type lock to prevent inadvertent activation or de-activation. The lever positions and indicator light shall be clearly marked.

**OFFICER DASH**

There will be a flat surface area in front of the officer for use with such items as a lap top computer.

# MIDDLE GROVE FIRE COMPANY

**Bidder  
Complies**

**Yes      No**

## CENTER OVERHEAD PANEL

An overhead console with a removable pewter panel will be provided on the cab interior overhead between the driver and officer to permit installation of cab stereo, intercom systems, arrow stick controls, etc. The overhead console will be approximately 27" wide x 4" high x 13" deep and will be integrated into the ABS overhead center panel. The overhead console will not obstruct the driver's vision through the officer's side window.

## CLIMATE CONTROL SYSTEM

A climate-control system will be provided for total cab environmental comfort. This system will provide heat, cooling and defrost capabilities to various areas in the cab. The system will consist of a single evaporator unit, mounted in the center overhead of the cab.

The ceiling mounted evaporator/heater unit will include the following:

- Heavy-duty, high output blower.
- High efficiency coil that includes "rifled" tubing and oversized header tubes for maximum refrigerant distribution.
- Four (4) 3" diameter, adjustable louvers; two (2) each side of the cab overhead, facing the driver and officer seat positions.
- Two (2) larger louvers located in the center of the overhead assembly, facing the windshield.
- A large center mounted multi-vent defroster louver positioned above the windshield to provide adequate airflow for windshield defrost.
- Four (4) integral 3" diameter louvers, one (1) below the driver and officer seat positions and one (1) under each outboard rear facing crew seat.
- Damper controls will be pneumatically operated to provide air discharge to the windshield, front overhead air discharge louvers or the seat riser/floor outlets as required.
- An adjustable electric water valve to control the amount of heat.
- Housing will be fully insulated and enclosed.
- BTU: 71,000 A/C
- BTU: 85,000 Heat
- CFM: 680 Heat as mounted in the cab
- CFM: 680 A/C as mounted in the cab

The ceiling mounted evaporator unit will be designed to include a deep well condensate collection pan, which will include an automatic air vacuum pump to ensure proper drainage.

The ceiling mounted evaporator unit will be enclosed with an ergonomically designed, custom padded ABS panel to provide maximum headroom and a pleasing appearance.

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

The controls panel 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.

All defrost/heating systems will be plumbed with one (1) seasonal shut-off valve mounted near the engine.

## 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.



# MIDDLE GROVE FIRE COMPANY

**Bidder  
Complies**

**Yes      No**

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 drivers overhead panel will contain all controls for the cab climate control system. The following controls will be provided: mode selector switch, front fan speed switch, rear fan speed switch, air conditioning on/off switch, and temperature control dial. All controls will be clearly labeled, adequately backlit, and installed in an easily removable panel.

## **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."

# MIDDLE GROVE FIRE COMPANY

**Bidder  
Complies**

**Yes**

**No**

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 will be installed. Total section modulus of each rail, with liner, will be 33.555 cu in and the total resisting bending moment (RBM) will be a minimum of 3,691,050 in-lbs, per rail.

A third inner frame liner will be provided between the front and rear axle spring hangers. Total section modulus of each rail, with both liners, will be 42.180 cu in and the total resisting bending moment (RBM) will be 4,639,800 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 16" with a polished aluminum tread plate gravel shield enclosing the top and ends.

The polished aluminum tread plate gravel shield will terminate under the top bumper flange.

#### **STORAGE WELL - CENTER**

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

The tread plate hose well cover will have a notch cut out to allow pre-connection of suction/discharge hose.

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

#### **REEL STORAGE COVER**

A raised tread plate cover will be provided over the specified reel in the front bumper. A 1" lip will be provided around the perimeter of the well to provide a weather tight seal when the cover is down. The cover will be hinged at the bottom rear and will be held in the open position with One (1) gas shock stay arm. The cover will be secured in the closed position with two (2) rubber hold down clamps. One (1) chrome "D" grab handle 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.

# MIDDLE GROVE FIRE COMPANY

**Bidder  
Complies**

**Yes      No**

## **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.

## **FRONT BUMPER CHEVRON STRIPING**

Chevron striping will be applied to the front bumper as described in the lettering and striping section.

## **FRONT AXLE**

Front axle will be a Meritor MFS-20-133 A-N, includes low friction "Easy Steer" bushing technology for maximum steering ease and longer life.

The front axle will be rated at 22,500 lbs.

## **FRONT DISC BRAKES**

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

## **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 23,000 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 assembly will be a tandem, Meritor RT-46-160 single reduction with a capacity of 48,000 lbs. Axles will have a gear reduction as required.

A driver controlled Power Divider Lock (PDL), will allow full driveshaft torque to be sent to both rear axles in low traction situations when a tire on one axle is slipping. This feature will be disengaged during normal driving to prevent interaxle differential damage. An electric over air-operated switch will be provided in the cab driver dash area.

Oil seals will be provided as standard equipment.

## **REAR DISC BRAKES**

Meritor EX-225, 17" disc brakes will be provided for the rear tandem axles. The rear brakes will be full air actuated with automatic slack adjustment.

# MIDDLE GROVE FIRE COMPANY

**Bidder  
Complies**

**Yes      No**

## 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

A Hendrickson "FIREMAAX" model #FMX-482 air ride suspension will be provided for the tandem rear axle. The suspension will have a weight rating equal to the rear axle weight rating up to 48,000 pounds.

## **\*\*\*\*\* 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.

### 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.

# MIDDLE GROVE FIRE COMPANY

**Bidder  
Complies**

**Yes      No**

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.

## **ELECTRONIC STABILITY CONTROL (ESC)**

Electronic Stability Control (4 or 6 Channel) will be provided as part of the Standard ABS system. The Electronic Stability Control system will be capable of recognizing and assisting in both rollover and vehicle-under and over-steer situations through advanced monitoring of vehicle parameters and automatic and selective application of the chassis brakes. The Electronic Stability system will use lateral and yaw accelerometers, wheel speed sensors, ABS pressure modulator valves and an ECU to control the four corners of the vehicle. The controller will monitor the vehicle response to turning and braking, and adjust or modulate the brake pressure at the wheel end to slow the vehicle in roll control, stabilize the vehicle when under or over steering, and modulate brake pressure when excessive wheel slip, or wheel lockup is detected. By these actions, the ESC system will help to maintain vehicle lateral and roll stability, improve braking and steering during heavy brake applications and braking on slippery surfaces.

## **AUTOMATIC TRACTION CONTROL (ATC)**

To further improve vehicle drive characteristics, the unit will be fitted with automatic traction control (ATC). This system will control drive wheel slip during acceleration from a resting point. An extra solenoid valve will be added to the ABS system. The system will control the engine and brakes to ensure efficient acceleration. The system will be equipped with a dash-mounted light indicating the ATC is controlling drive wheel slip. The system will also include an "off road traction" dash mounted switch that will allow the operator to momentarily allow for more wheel slip when the unit is in deep mud or snow.

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 four (4) air reservoirs and be installed in conformance with best automotive practices.

Reservoir capacity total will be a minimum of 7100 cu. in.

# MIDDLE GROVE FIRE COMPANY

**Bidder  
Complies**

**Yes      No**

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
- Auxiliary Tank(s)                            Yellow.

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

## **AIR DRYER**

A Bendix AD-9, 12 volt heated air dryer will be furnished. An automatic moisture ejector on the primary or wet tank will also be furnished.

## **AIR LINES**

The entire chassis air system will be plumbed utilizing reinforced, Synflex air lines. 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 12.25" 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.

# MIDDLE GROVE FIRE COMPANY

**Bidder  
Complies**

**Yes      No**

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.

NOTE: NEVER EXCEED THE MAXIMUM AIR PRESSURE LIMITATION.

## **REAR WHEELS & TIRES**

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

The tandem rear 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 Regional RHD II+ traction tread. The tires will be fire service rated up to 64,000lbs 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.

NOTE: NEVER EXCEED THE MAXIMUM AIR PRESSURE LIMITATION.

## **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 20 and 120 psi. The sensor will activate an integral battery operated LED when the pressure of that tire drops 8 psi.

Removing the cap from the sensor will indicate the functionality of the sensor and battery. If the sensor and battery are in working condition, the LED will immediately start blinking.

# MIDDLE GROVE FIRE COMPANY

**Bidder  
Complies**

**Yes      No**

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

**ENGINE**

Engine will be a Cummins, Model ISX15 600, diesel, turbo-charged, per the following specifications.

- Max. Horsepower                      600 HP @ 1800 RPM
- Governed Speed                        2100 RPM
- Peak Torque                             1850 lb. ft. @ 1200 RPM
- Cylinders                                 Six (6)
- Operating Cycles                        Four (4)
- Bore & Stroke                            5.39 x 6.65 in.
- Displacement                            912 cu. in.
- Compression Ratio                      17.2:1
- Governor Type                          Limiting Speed
- Drive line Size                          1810 Series.

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**

The radiator and the complete cooling system will meet or exceed NFPA and engine manufacturer cooling system standards.

To provide maximum corrosion resistance and cooling performance, the entire radiator core will be constructed using long life aluminum alloy. The core will be made of aluminum fins, having a serpentine design, brazed to aluminum tubes. The tubes will be brazed to aluminum headers. No solder joints or leaded material of any kind will be acceptable in the core assembly.

The radiator core will have a height of 35.92" x a width of 37.62". Supply and return tanks made of glass-reinforced nylon will be crimped on to the core assembly using header tabs and a compression gasket to complete the radiator core assembly. The radiator will be compatible with commercial antifreeze solutions.

There will be a full steel frame around the entire radiator core assembly. The radiator core assembly will be isolated within the steel frame by rubber inserts to enhance cooling system durability and reliability. The radiator will be mounted in such a manner as to prevent the development of leaks caused by twisting or straining when the apparatus operates over uneven ground. The radiator assembly will be isolated from the chassis frame rails with rubber isolators.

The cooling system will include a surge tank mounted to the top of the radiator framework that will remove air in the system. The surge tank will be equipped with a sight glass to monitor the level of coolant. The radiator will be equipped with a dual seal cap that will allow for expansion and recovery of coolant into a separate integral chamber.

The cooling system will be designed for a maximum of fifteen (15) PSI operation.



# MIDDLE GROVE FIRE COMPANY

**Bidder  
Complies**

**Yes      No**

A drain port will be located at the lowest point of the cooling system and/or the bottom of the radiator to permit complete flushing of the coolant from the system.

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

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 SKID PLATE**

The radiator installation will include a heavy-duty radiator skid plate to protect the radiator from debris or obstructions under the chassis. The skid plate 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. To not restrict air flow to the radiator, the charge air cooler will designed to be an integral part of the radiator assembly, mounted directly on top of the radiator. 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.

Charge air coolers that are located in front of the radiator, that block or restrict air flow into the engine radiator or introduce above ambient temperature air into the radiator in any way will not be used.

## **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.

# MIDDLE GROVE FIRE COMPANY

**Bidder  
Complies**

**Yes**

**No**

## **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.

Two (2) mechanical shut off valves will be installed on the engine to shut down the flow of coolant to the cab heating system.

## **LOW COOLANT INDICATOR LIGHT AND ALARM**

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

## **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 switches located on the smart wheel.

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.

# MIDDLE GROVE FIRE COMPANY

**Bidder  
Complies**

**Yes      No**

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.

## **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 4000 EVS electronically controlled, automatic transmission will be provided. Transmission specifications will be as follows:

- Max. Gross Input Power            600 HP
- Max. Gross Input Torque            1850 lb. ft.
- Input Speed (Range)                1700- 2300 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 one (1) o'clock and eight (8) o'clock).

# MIDDLE GROVE FIRE COMPANY

**Bidder  
Complies**

**Yes**

**No**

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

- First 3.51:1
- Second 1.91:1
- Third 1.43:1
- Fourth 1.00:1
- Fifth 0.74:1
- Reverse -4.80:1

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 Preselect enabled to automatically downshift when the secondary engine brake is active.

The transmission will be programmed at the factory to automatically downshift to 4th 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 4000 EVS transmission.

## **DRIVE LINES**

Drive lines will be Dana (Spicer) 1810 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.

## **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 sensor will be provided with the DEF tank and connected to the level gauge on the dashboard.

**MIDDLE GROVE FIRE COMPANY**

**Bidder  
Complies**

**Yes**

**No**

# MIDDLE GROVE FIRE COMPANY

**Bidder  
Complies**

**Yes**

**No**

## **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 (NH<sub>3</sub>), in conjunction to the SCR catalyst, converts the NOx to harmless nitrogen (N<sub>2</sub>) and water (H<sub>2</sub>O).

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. 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.

# MIDDLE GROVE FIRE COMPANY

**Bidder  
Complies**

**Yes      No**

The fuel lines will be textile reinforced synthetic rubber or plastic hose that is approved for use with diesel fuel and has a minimum max temperature rating of 250° F. 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 ergonomically designed, self-canceling lever, that will control the following functions:

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

# MIDDLE GROVE FIRE COMPANY

**Bidder  
Complies**

**Yes      No**

## **SMARTWHEEL STEERING WHEEL**

The steering column will be a "Smart Wheel" multiplexed steering wheel. The "Smart Wheel" will be designed so that the driver's hands never need to leave the steering wheel once the engine is running and the parking brake is released.

The "Smart Wheel" steering wheel will include ten (10) multiplexed switches that control the following functions:

- Air Horn
- Q2B (If Equipped)
- Q2B Brake (If Equipped)
- Master Warning Switch
- Mic (Push to talk)
- Siren
- Auxiliary Braking
- High Idle
- Throttle Up - High Idle Function
- Throttle Down - High Idle Function

The functions will be multiplexed through a clock spring circuit board. Collector rings switch wiring is not acceptable! The steering wheel will be 18 inches in diameter.

In addition to the Smart Wheel switches the electric horn switch will be located in the center of the steering wheel.

## **4FRONT® - FRONTAL AIR BAG PROTECTION**

The cab will be equipped with a frontal impact protection system consisting of one (1) air bag in front of the driver in the steering wheel. The steering wheel air bag will be designed to protect the driver in the event of a frontal or oblique impact.

The driver seat will be equipped with a S4 pretensioner for suspension seat (if required) and a seat belt pretensioner.

## **4FRONT® - FRONTAL AIR BAG PROTECTION FOR OFFICER SIDE KNEE BOLSTER**

Frontal impact protection system consisting of one (1) knee bolster air bag, in front of the officer mounted in the firewall panel below the dash panel. The officer seat will be equipped with a S4 pretensioner for a suspension seat (if required) and a seat belt pretensioner.

The officer side knee bolster air bag will be designed to protect the legs of the occupant, when used in combination with the 3-point seat belt, in the event of a frontal or oblique impact.

The frontal air bag system will be designed specifically for the cab configurations they are used in. The cab and chassis design will have been subjected, via third party test facility, to a 21 MPH crash impact during frontal and oblique impact testing. Testing will include all major chassis and cab components such as mounting straps for fuel and air tanks, suspension mounts, front suspension components, rear suspension components, frame rail cross members, engine and transmission and their mounts, pump house and mounts, frame extensions and body mounts. The testing will provide configuration specific information used to optimize the timing for firing the air bags.



**MIDDLE GROVE FIRE COMPANY**

**Bidder  
Complies**

**Yes**

**No**

The driver side air bag will be mounted in the steering wheel and will be designed to protect the head and upper torso of the occupant, when used in combination with the 3-point seat belt, in the event of a frontal or oblique impact.

# MIDDLE GROVE FIRE COMPANY

**Bidder  
Complies**

**Yes      No**

The passenger side knee bolster air bag will be mounted in the modesty panel below the dash panel and will be designed to protect the legs of the occupant, when used in combination with the 3-point seat belt, in the event of a frontal or oblique impact.

In the event of a frontal or oblique impact, the system will deploy air bag/s, and activate the following components integrated into seating position equipped with an air bag:

Suspension seats will be retracted to lowest travel position. Seat belts will be pretensioned to firmly hold the occupants in place.

## **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 of custom construction.

The power distribution centers will be function oriented. The first is to control major truck function. The second control center will enable overhead switching and interior operations. Each module will be 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 Degrees Fahrenheit and a flammability rating of VW-1 as defined in UL62. The covering of jacketed cable will have a minimum rating of 289 degree Fahrenheit.

# MIDDLE GROVE FIRE COMPANY

**Bidder  
Complies**

**Yes      No**

All harnesses will be securely installed in areas protected against heat, liquid contaminants and damage. The harness connections and terminations will use a method that provides a positive mechanical and electrical connection and are in accordance with the device manufacturer's instructions. No connections within the harness may utilize wire nut, insulation displacement, or insulation piercing components.

All circuits will conform to SAEJ1292. All circuits will be provided with low voltage over current protective devices. These devices will be readily accessible and protected against heat in excess of component rating, mechanical damage, and water spray. Star washers will not be used for ground connections.

## **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.

## **EMI/RFI PROTECTION**

The apparatus will incorporate the latest designs in the electrical system with state of the art components to insure that radiated and conducted electromagnetic interference (EMI) and radio frequency interference (RFI) emissions are suppressed at the source.

The apparatus proposed will have the ability to operate in the environment typically found in fire ground operations with no adverse effects from EMI/RFI.

EMI/RFI susceptibility is controlled by utilizing components that are fully protected and wiring that utilizes shielding and loop back grounds where required. The apparatus will be bonded through wire braided ground straps. Relays and solenoids that are suspect to generating spurious electromagnetic radiation are diode protected to prevent transient voltage spikes.

In order to fully prevent the radio frequency interference the purchaser may be requested to provide a listing of the type, power output, and frequencies of all radio and bio medical equipment that is proposed to be used on the apparatus.

## **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.

# MIDDLE GROVE FIRE COMPANY

**Bidder  
Complies**

**Yes      No**

## 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.

## LOAD MANAGEMENT SYSTEM

A load management system will be provided. The load manager will have 16 programmable outputs to supply warning and load switching requirements. The load management system will be capable of offering load sequencing, load shedding, fast idle control, low voltage warning, scene mode operation and response mode operation.

Outputs 1 thru 12 will be independently programmable to activate during the scene mode, the response mode or both. These outputs can also be programmed to activate with the ignition or master warning switch, or to sequence and shed along with the priority. Output 13 will be designated to activate a fast idle system. Output 14 will provide a low voltage warning for an isolated battery. Output 15 is a user configurable output and will be programmable for activating between 10.5 and 15 volts. Output 16 will provide a low voltage alarm that activates at the NFPA required 11.8 volts.

The load management will have a digital display to indicate system voltage in normal operation mode and also indicate the output configuration during programming mode.

The load management will also be protected against reverse polarity and shorted outputs, and be enclosed in a metal enclosure to enhance EMI/RFI protection.

# MIDDLE GROVE FIRE COMPANY

**Bidder  
Complies**

**Yes**

**No**

## **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.

# MIDDLE GROVE FIRE COMPANY

**Bidder  
Complies**

**Yes      No**

## 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.

# MIDDLE GROVE FIRE COMPANY

**Bidder  
Complies**

**Yes      No**

- 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**

Five (5) Exide #HP-31D, Group 31, maintenance free batteries will be provided. 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 for SAEJ541.

## **BATTERY STORAGE**

# MIDDLE GROVE FIRE COMPANY

**Bidder  
Complies**

**Yes      No**

Batteries will be securely mounted in fixed 3/16" GR50 steel trays located on each 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 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 091-55-15-120, automatic, 120 volt, 15 amp shoreline disconnect will be provided for the on board, 110 volt battery charging systems.

The disconnect will be equipped with a NEMA 5-15 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 Red 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 # 091-9-12V-1200, "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.



# MIDDLE GROVE FIRE COMPANY

**Bidder  
Complies**

**Yes      No**

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

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

## **EMERGENCY SWITCHES**

A switch control console will be provided in the center dash panel between the driver's and officer's position. This console will separate the emergency / auxiliary electrical functions from the regular chassis functions. A minimum of ten (10) rocker type switches with integral indicator lights will be provided, in addition to the Load Manager indicator.

A master warning switch will be provided, which will allow pre-setting of emergency light switches and will have a red integral indicator light. Next to the master switch, a total of eight (8) load manageable emergency switches will be provided. The last remaining switch will be a ground light switch. All switches, (other than the master switch), will have switch function labeling and an amber integral indicator light.

## **"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 LED's. Each dome light will also activate when the respective, adjacent cab door is opened.

Two (2) Whelen # 60CREGCS, 6" round, interior LED combination red/white dome lights will be furnished in the rear section of the cab. Each dome light will have individual switches to control the red or white LED's.

## **CAB MAP LIGHT**

A Hella, model # 343-720-622, "Red/White", 16" LED goose neck map light will be furnished and located on the officer's side of the cab dash next to the door "A" post. Both the red and white lights will have adjustable intensities with a rotary switch located on the head of the light.

## **"DO NOT MOVE APPARATUS" WARNING LIGHT WITH AUDIBLE ALARM**

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 door or body compartment door, an extended ladder rack, a deployed stabilizer, an extended light tower or any other device which is opened, extended or deployed which may cause damage to the apparatus if it is moved.

This light will be activated through the parking brake switch to signal when the parking brake is released. 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.

## **12 VOLT POWER PORT - REAR OF DOGHOUSE**

# MIDDLE GROVE FIRE COMPANY

**Bidder  
Complies**

**Yes      No**

Two (2) 12 volt power port accessory outlet(s) will be installed in the cab of the truck for fire department accessory devices. The port(s) will be located in the rear crew area, on the rear of the doghouse.

## **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.

## **REAR VISION CAMERA/GPS SYSTEM**

An Optimo rear vision camera/GPS system model # GPS-7101 will be provided to allow the driver to visually see the rear of the apparatus while in the cab. The system will include a high resolution 7" touch screen with LED Backlight and anti glare system with an auto dimmer. The system will include audio transmission from the camera.

A Sygic premium turn by turn navigation system with maps and a robust set of features will be included as standard equipment.

The system will have 3 viewing modes, navigation, picture in picture (camera and navigation), and full back-up camera mode.

The rear vision camera will be wired to automatically activate when the chassis transmission is placed in reverse.

The system will carry a two (2) year warranty from Optimo.

The monitor for the rear vision system will be mounted ceiling of the cab in easy view of the driver.

## **HEADLIGHTS CLUSTER**

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

## **DAYTIME RUNNING LIGHTS**

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

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

## **SECONDARY DUAL LIGHT MODULE**

Two (2) Code 3 65STA arrow shaped, amber LED turn signals will be provided, one (1) in each side of the dual light module above the headlights.

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

## **DOT MARKER LIGHTS AND REFLECTORS**

# MIDDLE GROVE FIRE COMPANY

**Bidder  
Complies**

**Yes      No**

Five (5) DOT approved Whelen (or equal) Light Emitting Diode (LED) cab marker lamps will be mounted on the top front edge of the cab roof.

Amber LED marker lights with integral reflectors will be provided on the side of the cab adjacent to the driver's door, one (1) each side.

Truck-Lite Model # 18 red LED marker lights with integral reflectors will be provided at the lower side rear, one (1) each side.

Truck-Lite # 60115Y 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.

Truck-Lite Model #19 red LED clearance lights will be provided on the apparatus rear upper, one (1) each side at the outermost practical location.

Truck-Lite Model # 33740R 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.

## **LED LICENSE PLATE LIGHTS - REAR**

Two (2) Whelen model # 0AC0EDCR LED license plate lights will be provided above the mounting position of the license plate. The lights will be clear in color and will have a chrome finish. They will be mounted 1-2" high above the license plate and spaced apart 3" off center.

## **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**

Chrome plated Whelen model # 0AC0EDCR, shielded LED 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.

## **BODY STEP LIGHTS**

# MIDDLE GROVE FIRE COMPANY

**Bidder  
Complies**

**Yes**

**No**

Chrome plated Whelen model # 0AC0EDCR, shielded LED 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.

## **DUNNAGE AREA LIGHTING**

Two (2) chrome plated Whelen model # 0AC0EDCR, shielded LED lights will be provided in the dunnage area to provide adequate illumination of this area.

## **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, above the fixed crew cab window in a chrome plated flange. Each light will be 9" wide by 6 ¾" high by 1 ¾" deep 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 and produce 7,000 lumens. The scene lights will be wired through the load management system.

## **SCENE LIGHTS - DRIVER SIDE OF BODY**

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

## **SCENE LIGHTS - OFFICER SIDE OF BODY**

Two (2) Fire Research Spectra 900 LED scene lights will be provided. The scene lights will be installed one rearward and one forward on the officer side of the body in a chrome plated flange. Each light will be 9" wide by 6 ¾" high by 1 ¾" deep 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.

## **CAB DOOR LIGHT SWITCHING - PUMP PANEL**

Two (2) switches will be provided on the pump panel 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.

## **REAR OF BODY LIGHT SWITCHING - PUMP PANEL**

A switch will be provided on the pump panel to turn the rear of body lights on and off.

## **DRIVER SIDE OF BODY LIGHT SWITCHING - CAB**

# MIDDLE GROVE FIRE COMPANY

**Bidder  
Complies**

**Yes      No**

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

## **DRIVER SIDE OF BODY LIGHT SWITCHING - PUMP PANEL**

A switch will be provided on the pump panel to turn the driver side of body lights on and off.

## **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.

## **OFFICER SIDE OF BODY LIGHT SWITCHING - PUMP PANEL**

A switch will be provided on the pump panel to turn the officer side of body lights on and off.

## **CAB SCENE LIGHTS - ADDITIONAL ACTIVATION**

In addition to the cab mounted switch for the cab scene lights, the driver and officer cab doors 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 - MIDSHIP**

One (1) Amdor Luma Bar H2O LED 20" ground light will be provided under each midship compartment, total of 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 - FRONT BODY**

One (1) Amdor Luma Bar H2O LED 20" ground light will be provided under each front 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 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.

**MIDDLE GROVE FIRE COMPANY**

**Bidder  
Complies**

**Yes**

**No**

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# MIDDLE GROVE FIRE COMPANY

**Bidder  
Complies**

**Yes      No**

## GROUND LIGHT SWITCHING

The cab and body ground lights will be equipped with an activation switch on the pump operator's panel.

## GROUND LIGHT SWITCHING

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

## ROOF MOUNT 155W LED BROW LIGHT - ABOVE WINDSHIELD

Fire Research Spectra LED Scene Light model SPA800-Q15 contour mount light will be installed. The mounting brackets will attach to the bottom of the lamphead and be machined to conform to the roof radius. Wiring will extend from a weatherproof strain relief at the rear of the lamp head.

The lamp head will have sixty (60) ultra-bright white LEDs, 48 for flood lighting and 12 to provide a spot light beam pattern. It will operate at 12 volts DC, draw 13 amps, and generate 15,000 lumens of light. The 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 lamp head will be no more than 5 7/8" high by 14" wide by 3 1/2" deep and have a heat resistant handle. The lamp head and mounting arm will be powder coated. The LED scene light will be for fire service use.

The Spectra brow mounted flood light will be located above the windshield in the center of the cab.

## LIGHT(S) ABOVE WINDSHIELD SWITCHING - CAB

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

## LIGHT(S) ABOVE WINDSHIELD SWITCHING - PUMP PANEL

A switch will be provided on the pump panel to turn the light(s) above the windshield on and off.

## **\*\*\*\* 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.

# MIDDLE GROVE FIRE COMPANY

**Bidder  
Complies**

**Yes      No**

## **BODY ELECTRICAL JUNCTION COMPARTMENT**

A weather resistant electric junction compartment will be provided within the body or pump enclosure, depending on vehicle configuration. This compartment will provide an easily accessible enclosure to house all of the body wiring junction points, terminal strips, solenoids, etc. The design of this compartment will not decrease the storage capacity area of the compartment or area in which it is located. A removable panel will be provided for access to this compartment.

## **PUMP ENCLOSURE WORK LIGHTS**

Two (2) Grote model #61171 LED lights will be provided inside the pump enclosure providing a minimum of 20 candlepower illumination. Each light will have their own independent switch incorporated into the light head.

## **ENGINE COMPARTMENT WORK LIGHTS**

Two (2) Grote model #61171 LED lights will be provided inside the engine enclosure that will provide a minimum of 20 candlepower illumination. Each light will have their own independent switch incorporated into the light head.

## **ROM TRACK MOUNTED COMPARTMENT LIGHTS - LED**

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

## **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 an NFPA compliant flash pattern by the apparatus manufacturer.



# MIDDLE GROVE FIRE COMPANY

**Bidder  
Complies**

**Yes      No**

## 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
- Fourteen Forward Facing Red - TriCore 6 LED Red 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.

One light head will be equipped with Blue LED's and a colored lens on the drivers side.  
One light head will be equipped with Yellow LED's and a colored lens on the officers side.

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

### NFPA ZONES B & D REAR, UPPER

Two (2) surface mounted Code 3 798\*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 LED's 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 3 798\*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 LED's 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 65BZ\* LED light heads will be provided and installed one (1) each side.

Each light head will be equipped with red LED's 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.

# MIDDLE GROVE FIRE COMPANY

**Bidder  
Complies**

**Yes      No**

## **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 LED's and a colored lens.

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

## **NFPA ZONES B & D FRONT, LOWER**

Two (2) Code 3 468\*BZ-75 PriZm II LED light heads will be provided and installed one (1) each side.

Each light head will be equipped with red LED's 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 3 468\*BZ-75 PriZm II LED light heads will be provided and installed one (1) each side.

Each light head will be equipped with red LED's and a colored lens.

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

## **NFPA ZONES B & D REAR, LOWER**

Two (2) Code 3 468\*BZ-75 PriZm II LED light heads will be provided and installed one (1) each side.

Each light head will be equipped with red LED's 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.

## **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.

# MIDDLE GROVE FIRE COMPANY

**Bidder  
Complies**

**Yes      No**

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

**ELECTRIC HORN**

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

**BACK-UP ALARM**

A Code 3, model # D450C, 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) 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.

Both air horns will be recessed in the front bumper.

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, 100 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.

One (1) 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 second push button siren brake switch will be provided on the cab dash near the officers seating position.

**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.

# MIDDLE GROVE FIRE COMPANY

**Bidder  
Complies**

**Yes      No**

## \*\*\*\* PUMP AND PLUMBING \*\*\*\*

### PUMP

- HALE QMAX-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.

### PUMP CONSTRUCTION

The entire pump will be manufactured and tested at the pump manufacturer's factory.

The pump will be driven by a drive line from the truck transmission. The engine will provide sufficient horsepower and RPM to enable the pump to meet and exceed its rated performance.

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

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

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

### PUMP SHAFT

Pump shaft to be rigidly supported by three bearings for minimum deflection. One high lead bronze sleeve bearing will be located immediately adjacent to the impeller (on side opposite the gearbox). The sleeve bearing is to be lubricated by a force fed, automatic oil lubricated design, pressure balanced to exclude foreign material.

The pump shaft will be heat-treated, electric furnace, corrosion resistant stainless steel to be super-finished under packing with galvanic corrosion (zinc foil separators in packing) protection for longer shaft life. Pump shaft must be sealed with double-lip oil seal to keep road dirt and water out of gearbox.

### PUMP IMPELLER

# MIDDLE GROVE FIRE COMPANY

**Bidder  
Complies**

**Yes      No**

The pump will have one double suction impeller. The pump body will have two opposed discharge volute cutwaters to eliminate radial unbalance.

Pump impeller will be hard, fine grain bronze of the mixed flow design; accurately machined and individually balanced. The vanes of the impeller intake eyes will be of sufficient size and design to provide ample reserve capacity utilizing minimum horsepower.

Impeller clearance rings will be bronze, easily renewable without replacing impeller or pump volute body, and of wrap-around double labyrinth design for maximum efficiency.

## **PUMP PACKING GLAND**

The pump shaft will have only one (1) packing gland located on inlet side of the pump. It will be a split design for ease of repacking. The packing gland must be a full circle threaded design to exert uniform pressure on packing and to prevent cocking and uneven packing load when it is tightened. It will be easily adjusted by hand with rod or screwdriver with no special tools or wrenches required. The packing rings will be of a unique permanently lubricated, long life graphite composition and have sacrificial zinc foil separators to protect the pump shaft from galvanic corrosion.

## **PUMP DRIVE UNIT**

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

Pump drive unit will be of sufficient size to withstand up to 16,000 lbs. ft. of torque of the engine in both road and pump operating conditions. The drive unit will be designed of ample capacity for lubrication reserve and to maintain the proper operating temperature.

The gearbox drive shafts will be of heat treated chrome nickel steel and at least 2-3/4 inches in diameter on both the input and output drive shafts. They will withstand the full torque of the engine in both road and pump operating conditions.

All gears, both drive and pump, will be of the highest quality electric furnace chrome nickel steel. Bores will be ground to size and teeth integrated, chrome-shaven and hardened, to give an extremely accurate gear for long life, smooth, quiet running and higher load carrying capability. An accurately cut spur design will be provided to eliminate all possible end thrust.

## **PUMP 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 CONTROL**

The drive unit will be equipped with a power shift. The shifting mechanism will be a heat treated, hard anodized aluminum power cylinder with stainless steel shaft. An air operated in-cab control for rapid shift will be provided that locks in road or pump, with a neutral position for use when manual override is required.

## **MAIN PUMP - PUMP SHIFT INDICATOR LIGHTS**

For automatic transmissions, three (3) green warning lights will be provided to indicate to the operator(s) when the pump has completed the shift for Road to Pump position. Two (2) green lights to be located in the truck driving compartment and one (1) green light on pump operator's panel adjacent

# MIDDLE GROVE FIRE COMPANY

**Bidder  
Complies**

**Yes      No**

to the throttle control. For manual transmissions, one (1) green warning light will be provided for the driving compartment. All lights to have appropriate identification/instruction plates.

## **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.

Pumps which are not mounted directly to the frame will not be considered. Under no circumstance shall the pump function as a frame cross member.

## **\*\*\*\*\* 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.

**MIDDLE GROVE FIRE COMPANY**

**Bidder  
Complies**

**Yes**

**No**

# MIDDLE GROVE FIRE COMPANY

**Bidder  
Complies**

**Yes      No**

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**

An Akron Model 59 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).

## **PRIMING PUMP**

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

This priming system will be capable of priming at up to four(4) locations.

## **HALE DEDICATED PRIMING VALVE - FRONT SUCTION**

A dedicated additional primer control valve will be furnished for the front suction. This priming valve will activate the standard pump primer to minimize pump cavitation during remote suction operations and will be located on the pump operator's panel.



# MIDDLE GROVE FIRE COMPANY

**Bidder  
Complies**

**Yes      No**

## **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 "TRIDENT" quarter turn 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.

## **TOP MOUNT PUMP MODULE**

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

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

The 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, behind the top mount control panel, for equipment mounting and storage. This area will be furnished with a removable 3/16" aluminum tread plate floor and will be enclosed on the sides.

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

## **ENCLOSED TOP MOUNT PUMP PANEL**

The upper portion of the rear cab wall area will be extended to the rear approximately 20" to accommodate pump panel access from inside the rear of the cab. The lower section of the cab extension will have an integral "L" shaped cutout, which will allow the pump panel enclosure to protrude into the rear cab. The pump enclosure will incorporate a double overlapping style seal system, which will allow cab flexing around pump enclosure.

# MIDDLE GROVE FIRE COMPANY

**Bidder  
Complies**

**Yes      No**

## PUMP ENCLOSURE HEATER

The pump enclosure will be equipped with one (1) Hades 15,000 BTU hot water heater which utilizes chassis engine coolant run through heater hoses to prevent freezing of pump components during pumping operations in low temperature climates. The heater will be switched on the pump operator's panel.

## PUMP HEAT PAN

A bolt-on pump heat pan fabricated from 1/8" aluminum will be provided on the underside of the pump enclosure to act as a supplementary heating system by entrapping chassis exhaust heat during low temperature pumping operations.

The heat pan will have a slide out, removable bottom panel which should be removed for warm weather usage.

## **\*\*\*\*\* PUMP SUCTIONS & AUXILIARY INLETS \*\*\*\*\***

### SUCTION INLETS

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

### INTAKE BUTTERFLY VALVE - ELECTRIC OPERATED - DRIVER SIDE

The fire pump will be fitted with a Hale Master Intake Valve (MIV), on the driver side main suction inlet. The valve will be mounted between the suction tube extension and the suction tube, and will be recessed behind the operator's panel. 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 have a bore of 6.40". The valve will incorporate a pressure relief valve, set at the pump manufacturer's facility to a rating of 125 PSI. The pressure relief valve will provide protection for the suction hose even with the valve in the closed position. The valve will incorporate NFPA-1901 compliant, large diameter hose air bleed valve, controlled at the operator's panel.

The valve will be operated by a twelve (12) volt DC motor, as standard. It will also incorporate a knob control manual override, mounted at the suction inlet. The electric control will incorporate a placard with status lights to indicate whether the valve is in the closed, open or throttled position. The valve will not be able to move from fully open to fully closed in under three (3) seconds, in compliance with NFPA-1901.

### INTAKE BUTTERFLY VALVE - ELECTRIC OPERATED - OFFICER SIDE

The fire pump will be fitted with a Hale Master Intake Valve (MIV), on the officer side main suction inlet. The valve will be mounted between the suction tube extension and the suction tube, and will be recessed behind the operator's panel. 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 have a bore of 6.40". The valve will incorporate a pressure relief valve, set at the pump manufacturer's facility to a rating of 125 PSI. The pressure relief valve will provide protection for the suction hose even with the valve in the closed position. The valve will incorporate NFPA-1901 compliant, large diameter hose air bleed valve, controlled at the operator's panel.

The valve will be operated by a twelve (12) volt DC motor, as standard. It will also incorporate a knob control manual override, mounted at the suction inlet. The electric control will incorporate a placard with status lights to indicate whether the valve is in the closed, open or throttled position. The valve will not be able to move from fully open to fully closed in under three (3) seconds, in compliance with NFPA-1901.

# MIDDLE GROVE FIRE COMPANY

**Bidder  
Complies**

**Yes      No**

## **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.

## **FRONT SUCTION**

A 5" 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 5" 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 inlet will be gated with a 5" Bray in-line, full flow butterfly valve, located in the pump compartment.

An Akron model 59 inlet relief valve will be provided as part of the front suction plumbing, situated outboard of the rear suction gate valve.

The front suction valve will be air operated with a control switch located on the operator's panel with function plate.

One (1) 5" NST chrome plated long handle pressure vented cap(s) will be installed on front suction.

A 6" NST x 5" Storz Kocheck S37S adapter and cap will be provided for the drivers side and officers side suction inlets.

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

# MIDDLE GROVE FIRE COMPANY

**Bidder  
Complies**

**Yes      No**

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

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

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

## **TANK TO PUMP**

One (1) 4" tank to pump line will be, piped through the front bulkhead of the tank with a 90 degree elbow down into the tank sump. This line will be plumbed directly into the rear of the pump suction manifold for maximum efficiency.

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

A 3" Akron # 8800 series full flow, stainless steel ball valve will be provided between the pump suction manifold and the water tank.

A locking 1/4 turn swing control handle will be located on the operator's panel with function plate.

## **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 a 3" Akron # 8800 series full flow, stainless steel ball valve between the pump suction manifold and the water tank outlets.

The tank to pump valve will be air operated with a Class One air cylinder and control switch located on the operator's panel with function plate.

## **TANK FILL**

One (1) 2 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 1/2" high pressure hose for tank connection to accommodate flexing between components.

# MIDDLE GROVE FIRE COMPANY

**Bidder  
Complies**

**Yes      No**

An Akron Brass 2 1/2" 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 locking push/pull swing control handle will be located on the operator's panel with function plate.

**\*\*\*\*\* DISCHARGES & ACCESSORIES - TOP 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.

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

One (1) 2-1/2" NSTF X 1-1/2" NSTM reducer with cap will be provided on the driver's side # 1 discharge.

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

The driver's side # 1 discharge will be equipped with a 2 1/2" 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 seats.

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**Bidder  
Complies**

**Yes      No**

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.

The driver's side # 2 discharge cap provided as standard equipment will be deleted.

A 2-1/2" NSTF X 1-1/2" NSTM reducer with cap will be provided on the driver's side # 2 discharge.

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

The driver's side # 2 discharge will be equipped with a 2 1/2" 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/shall} be provided for the officer's side #1 discharge. The valve {will/shall} 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.

A 4" NST chrome plated pressure vented cap will be installed on officer's side # 1 discharge.

The officer's side # 1 discharge Akron ball valve will be equipped with an Akron Brass Style 9323 Valve Controller. The electric controls will be of true position feedback design, requiring no clutches in the motor or current limiting. The unit will be completely sealed with momentary open, close as well as an optional one touch full open feature to operate the actuator. Two additional buttons will be available to be used for preset selection, preset activation and menu navigation. The controller will have up to three preset locations that can be user set and easily recalled upon each use. The unit will be capable of being used in conjunction with at least two additional displays to control one valve. The unit will provide position indication through a full color backlit LCD display.

The officer's side # 1 discharge will be equipped with a 2 1/2" 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

# MIDDLE GROVE FIRE COMPANY

**Bidder  
Complies**

**Yes No**

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.

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

A 2-1/2" NSTF X 1-1/2" NSTM reducer w/cap will be provided on the officer's side #2 discharge.

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

The officer's side #2 discharge will be equipped with a 2 1/2" 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.

## **TOP MOUNT DISCHARGE CONTROLS**

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

## **DRIVER SIDE HOSE BED DISCHARGE**

A 2 1/2" NST rear hose bed discharge will be plumbed to the upper front body panel, extending into the front of the hose bed.

# MIDDLE GROVE FIRE COMPANY

**Bidder  
Complies**

**Yes      No**

The rear hose bed discharge will terminate just above the hosebed floor, in the driver side front of the hose bed.

The driver side hose bed discharge pipe will be equipped with a chrome 2 1/2" NSTM thread adapter.

The driver side hose bed 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 driver's side hose bed rear discharge. The valve will have an all brass body with flow optimizing stainless steel ball and dual polymer seats.

The driver side hose bed 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 the driver's side hose bed discharge.

The driver's side hose bed discharge will be equipped with a 2 1/2" 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 driver'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.

To improve the operation range of the deck gun, the discharge pipe will be outfitted with a TFT (18") Extend-A-Gun, part # XG18\*\*-\*\*. The Extend-A-Gun will be wired to the hazard light on the cab dash.

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.



# MIDDLE GROVE FIRE COMPANY

**Bidder  
Complies**

**Yes      No**

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.

## **FRONT DISCHARGE**

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

The front #1 discharge will terminate on the top center of the front bumper extension gravel shield with a chrome 1 1/2" NSTM chicksan swivel adapter.

The front #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 the front of the vehicle.

A minimum of one (1) grooved pipe coupling will be furnished in this assembly to allow for flex and serviceability. Automatic discharge drains will be provided at all low points in the plumbing.

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

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

A 1 1/2" NST chrome plated pressure vented cap will be installed the front #1 discharge.

The front #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.

# MIDDLE GROVE FIRE COMPANY

**Bidder  
Complies**

**Yes      No**

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 CROSSLAY #1**

A crosslay hose bed will be provided and plumbed from the pump in a transverse design, located above the pump enclosure for quick attack deployment. The crosslay hose bed flooring will be designed to be removable, constructed from brushed finish, perforated aluminum material.

Crosslay #1 will be designed to have a minimum total capacity of 3.5 cubic feet as required by NFPA -1901 to accommodate a minimum of 200 feet of 1-3/4" fire hose.

Crosslay #1 hosebed will be designed to accommodate the fire hose in a double stack configuration.

The crosslay discharge will terminate below the hosebed floor with a 1 1/2" NSTM chicksan swivel adapter. The crosslay hose bed floor will be slotted to allow the swivel to extend up through the floor, allowing the pre-connected hose to be pulled off either side of the apparatus without kinking the hose at the coupling connection.

The crosslay #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 crosslay hose bed.

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 crosslay #1 discharge. The valve will have an all brass body with flow optimizing stainless steel ball and dual polymer seats.

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

The crosslay #1 discharge will be equipped with a 2 1/2" 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 CROSSLAY #2**

A crosslay hose bed will be provided and plumbed from the pump in a transverse design, located above the pump enclosure for quick attack deployment. The crosslay hose bed flooring will be designed to be removable, constructed from brushed finish, perforated aluminum material.

# MIDDLE GROVE FIRE COMPANY

**Bidder  
Complies**

**Yes      No**

Crosslay #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.

Crosslay #2 hosebed will be designed to accommodate the fire hose in a double stack configuration.

The crosslay discharge will terminate below the hose bed floor with a 1 1/2" NSTM chicksan swivel adapter. The crosslay hose bed floor will be slotted to allow the swivel to extend up through the floor, allowing the pre-connected hose to be pulled off either side of the apparatus without kinking the hose at the coupling connection.

The crosslay #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 crosslay hose bed.

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 crosslay #2 discharge. The valve will have an all brass body with flow optimizing stainless steel ball and dual polymer seats.

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

The crosslay #2 discharge will be equipped with a 2 1/2" 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.

## **PUMP ENCLOSURE HOSEBED HOSE RETENTION**

A vinyl cross lay cover will be provided. It will be securely fastened at the front with snaps and Velcro at the rear, with straps to secure each end flap.

The crosslay cover will be red in color.

## **DRIVER SIDE WELL DISCHARGE**

A 1-1/2" discharge will be plumbed to the Driver Side lower pump panel.

A discharge will terminate in the driver side lower pump panel and will be equipped with a chrome 1 1/2" NSTM straight adapter.

A discharge will be plumbed utilizing 2" schedule 10 stainless steel piping and/or flexible hose in an assembly from the pump to the driver side well storage of the vehicle.

# MIDDLE GROVE FIRE COMPANY

**Bidder  
Complies**

**Yes      No**

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

A driver side well storage discharge valve will be controlled by a push/pull handle located on the operator's panel.

A 1 1/2" NST chrome plated pressure vented cap will be installed the driver side storage well discharge.

The driver side storage well discharge will be equipped with a 2 1/2" 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.

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

**FOAM PIPING - 1 INCH**

All foam concentrate plumbing from the tank or auxiliary foam inlet to the foam system components will be PVC.

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.

**FOAMPRO FOAM INJECTION SYSTEM**

A FoamPro model 2001, electronic, fully automatic, variable speed, direct injection, discharge side foam proportioning system will be installed in the pumping system. The system will be capable of handling Class "A" foam concentrates and most Class "B" foam concentrates. The foam proportioning operation will be based on direct measurement of water flows, and remain consistent within the specified flows and pressures. System must be capable of delivering accuracy to within 3% of calibrated settings over the advertised operation range when installed according to factory standards. The system will be equipped with a digital electronic control display suitable for installation on the pump panel. Incorporated within the control display will be a microprocessor that receives input from the system flowmeter, while also monitoring foam concentrate pump output, comparing values to ensure that the operator preset proportional amount of foam concentrate is injected into the discharge side of the fire pump.

A paddlewheel-type flowmeter will be installed in the discharge or manifold system specified to be "foam capable".

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

# MIDDLE GROVE FIRE COMPANY

**Bidder  
Complies**

Yes      No

A 12 or 24-volt electric motor drive positive displacement foam concentrate pump, rated up to 2.5 GPM (9.5 L/min) @ 150 psi with operating pressures up to 400 psi (27.6 BAR), will be installed in a suitable, accessible location. The system will draw a maximum of 40 amps @ 12 VDC or 21 amps @ 24 VDC. A pump motor electronic driver (mounted to the base of the pump) will receive signals from the computer control display and power the 1/2 hp (0.40 Kw) electric motor directly coupled to the concentrate pump in a variable speed duty cycle to ensure that the correct proportion of concentrate preset by the pump operator is injected into the water stream.

The digital computer control display located on the pump operator's panel will enable the pump operator to perform the following control and operation functions for the foam proportioning system:

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

The digital computer control display will interface with the options listed; provide dual foam calibration, and display separate totals for each foam concentrate used. If two foam tanks are required and piped to the foam concentrate pump, either an electric dual tank valve or the manual dual tank valve will be provided.

Components of the complete proportioning system will include:

- Operator control and display
- Paddlewheel flowmeter
- Pump and electric motor/motor driver
- Wiring harnesses
- Low-level tank switch (Switches)
- Electronic dual tank valve or manual dual tank valve (if more than one tank)
- Foam injection check valve
- Main waterway check valve

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

- 85 GPM water      3.0% concentration
- 260 GPM water      1.0% concentration
- 520 GPM water      0.5% concentration
- 1300 GPM water    0.2% concentration

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 flowmeter sensor, based on the systems capabilities.

**MIDDLE GROVE FIRE COMPANY**

**Bidder  
Complies**

**Yes**

**No**

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

Crosslay #1 discharge.

Crosslay #2 discharge.

Drivers side well discharge

# MIDDLE GROVE FIRE COMPANY

**Bidder  
Complies**

**Yes      No**

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.

## **FOAM CONCENTRATE**

The foam system will be capable of injecting the following foam concentrates:

- Class A - Knock-Down manufactured by Kidde Fire Fighting / National Foam.
- **No Class B foam selected or Class B foam system present.**

## **\*\*\*\* PUMP PANEL & ACCESSORIES \*\*\*\***

### **PUMP PANEL- ENCLOSED TOP MOUNT**

The pump operator's control panel will be located at the rear of the cab with the operator facing the rear of the apparatus to operate the pump controls in a fully enclosed area.

The top and side panels will be completely removable and designed for easy access and servicing.

### **PUMP PANEL - ENCLOSED TOP MOUNT**

The pump operator's control panel will be located at the rear of the cab with the operator facing the rear of the apparatus to operate the pump controls in a fully enclosed area.

The top and side panels will be completely removable and designed for easy access and servicing.

### **TOP MOUNT GAUGE PANEL**

The top operator's panel will be fabricated from 14-gauge 304L stainless steel with a #4, (150/180 grit), standard polished finish.

### **HINGED GAUGE PANEL**

An angled full width, horizontally hinged gauge access panel will be provided at the top mount operator's position. Chrome plated positive locks will be provided along with gas shock holders to secure the panel in the opened position.

### **VERTICALLY HINGED, SPLIT PUMP PANEL DRIVER SIDE**

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

# MIDDLE GROVE FIRE COMPANY

Bidder  
Complies

Yes No

## 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 tether cables 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 LIGHT SHIELD

The pump operator's panel will be equipped with a light shield that will be full width of the control panel, and will be positioned to cover the lights and prevent glare.

The light shield will be equipped with the following lights:

- Three (3) 20" Amdor Luma Bar H2O super bright led strip lights.

One (1) light under the operator's panel light shield will be actuated when fire pump is engaged in addition to the pump engaged light.

## TOP MOUNT WALKWAY LIGHTING

The top mount walkway will be illuminated by the following lights:

- Four (4) Whelen #OAC0EDCR 45 degree LED illumination lights.

The lights will be controlled with the marker lights.



# MIDDLE GROVE FIRE COMPANY

**Bidder  
Complies**

**Yes**

**No**

## DRIVER SIDE PUMP PANEL

The driver side pump panel will be equipped with a light shield/step that will be full width of the control panel, and will be positioned to cover the lights and prevent glare. The light shield will be fabricated from aluminum tread plate, which will also serve as a step. The step will be a minimum of 8" deep X the width of the pump panel.

The light shield will be equipped with the following lights:

- One (1) 20" Amdor Luma Bar H2O super bright led strip light.

The lights will be switched with the top mount panel lights.

## OFFICER SIDE PUMP PANEL

The officer side pump panel will be equipped with a light shield/step that will be full width of the control panel, and will be positioned to cover the lights and prevent glare. The light shield will be fabricated from aluminum tread plate, which will also serve as a step. The step will be a minimum of 8" deep X the width of the pump panel.

The light shield will be equipped with the following lights:

- One (1) 20" Amdor Luma Bar H2O super bright led strip light.

The lights will be switched with the top mount panel lights.

## PUMP OPERATOR'S PANEL

Particular attention is to be given to functional arrangement of all controls. The pump operator's panel 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

# MIDDLE GROVE FIRE COMPANY

**Bidder  
Complies**

**Yes      No**

- 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 #WLA200-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 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 LED's 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 LED's alert the operator when the tank is almost empty. Remote audio warning available.
- Onesize 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.

# MIDDLE GROVE FIRE COMPANY

**Bidder  
Complies**

**Yes      No**

## **CAB TANK LEVEL GAUGE**

A Fire Research model, WLA205-A00 miniature "TANKVISION" gauge that shows the actual volume of water in the tank will be provided in the cab. The "TANKVISION" gauge is designed for both ease of operation and installation. The "TANKVISION" gauge utilizes ultra bright LED's 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 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 water tank to determine the correct volume in the tank.

## **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 one (1) Fire Research MaxVision LED light mounted behind the rear crew door above the handrail. The light will have a wide-angle diffusion lens in front of the LEDs.

The light will be mounted as to indicate the following water levels and will be programmed to the "Ultra View" to include the following colors to indicate the water level in 1/8 tank increments:

- Green LEDs                      Full tank
- Blue LEDs                        3/4 tank
- Amber LEDs                     1/2 tank
- Red LEDs                         1/4 tank

The bottom LEDs will flash red to indicate under 1/4 tank and will show a down chasing pattern when the water level drops under 1/8 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 #WLA260-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 LED's 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.

## **OPERATOR'S PLATFORM**

A slide-out platform will be located below L1 and L4 compartments. The platform will be constructed from 2" aluminum tubing with Grip-Strut material inserts the step will have a minimum weight rating of 500 pounds. Deployment of this platform will be connected to the DO NOT MOVE TRUCK warning circuit. The step will slide on stainless steel pins fitted in a machined frame which will mount to the pump house frame. Drawer slides are not acceptable.

## **WATER TANK**

The water tank will have a capacity of 2500 gallons, constructed from polypropylene material.

# MIDDLE GROVE FIRE COMPANY

**Bidder  
Complies**

**Yes      No**

## **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 TANK 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 TANK 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 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 36" 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.

# MIDDLE GROVE FIRE COMPANY

**Bidder  
Complies**

**Yes**

**No**

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 6" I.D. schedule 40 P.V.C. combination overflow/vent pipe running from the fill tower through the tank to a 6" 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 3" SUMP DRAIN**

A 3" drain plug will be provided.

## **WATER TANK FLANGES/OUTLETS - TANKER**

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**

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 hose bed cross braces will act as water tank retainers.

## **WATER TANK LADDER STORAGE**

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

A hinged rear access door will be provided and tied into the "Do Not Move Apparatus" warning system.

## **10" NEWTON STAINLESS STEEL DUMP WITH ELECTRIC ACTUATOR - REAR**

The rear of the water tank will be equipped with a 10" Newton Stainless Steel Dump Valve, model #1080-34. The dump valve will be electronically actuated. The dump valve setup will be capable of discharging the water tank contents at a rate of at least 1800 G.P.M.

## **NEWTON STAINLESS STEEL 36" MANUAL TELESCOPING CHUTE**

The rear Newton Dump will be equipped with a Newton Model #4036-34, 36" manual telescoping, stainless steel dump chute.

# MIDDLE GROVE FIRE COMPANY

**Bidder  
Complies**

**Yes**

**No**

## **REAR DUMP SWITCHING - DRIVER AND OFFICER SIDE**

The rear dump switching will be installed on the driver and officer side of the rear body panel. The switches will be toggle style switches installed in protective cast enclosures with hinged doors. A light will be installed inside each enclosure to illuminate the switching area. These lights will be activated whenever the vehicle marker lights are turned on.

## **REAR DUMP SWITCHING - IN CAB**

The rear dump will be switched by a momentary style switch from inside the cab. The switch will be located in an area near the driver and will be a guarded style switch.

## **10" NEWTON STAINLESS STEEL DUMP WITH ELECTRIC ACTUATOR - DRIVER SIDE**

The driver side of the water tank will be equipped with a 10" Newton Stainless Steel Dump Valve, Model #1080-34. The dump valve will be electronically actuated. The dump valve setup will be capable of discharging the water tank contents at a rate of at least 1800 G.P.M.

## **NEWTON STAINLESS STEEL 18" ELECTRIC TELESCOPING CHUTE - DRIVER SIDE**

The driver's side Newton Dump will be equipped with a Newton Model #5018-34, 18" electric telescoping, stainless steel dump chute. The primary switch for the chute will be adjacent to the respective dump valve switch.

A polished stainless steel cover will be provided on the driver's fender to cover the dump cutout when the chute is in the retracted position. The cover will be hinged at the top and held in position by a gas-shock stay-arm. The cover will include a switch tied into the compartment door ajar alarm circuit to notify the operator if the door does not retract properly.

## **DRIVER SIDE DUMP SWITCHING - REAR OF BODY**

The driver dump switching will be installed on the driver side of the rear body panel. The switch will be a toggle style switch installed in a protective cast enclosure with a hinged door. A light will be installed inside the enclosure to illuminate the switching area. This light will be activated whenever the vehicle marker lights are turned on.

## **DRIVER SIDE DUMP SWITCHING - IN CAB**

The driver side dump will be switched by a momentary style switch from inside the cab. The switch will be located in an area near the driver and will be a guarded style switch.

## **DRIVER SIDE CHUTE SWITCHING - REAR BODY PANEL**

The driver's side chute switching will be installed on the driver side of the rear body panel, next to the dump switch. The switch will be a toggle style switch.

## **DRIVER SIDE CHUTE SWITCHING - IN CAB**

The driver's side chute will be switched by a momentary style switch from inside the cab. The switch will be located adjacent to the respective dump switch.

## **10" NEWTON STAINLESS STEEL DUMP WITH ELECTRIC ACTUATOR - OFFICER SIDE**

The officer side of the water tank will be equipped with a 10" Newton Stainless Steel Dump Valve, Model #1085-34. The dump valve will be electronically actuated. The dump valve setup will be capable of discharging the water tank contents at a rate of at least 1800 G.P.M.

# MIDDLE GROVE FIRE COMPANY

**Bidder  
Complies**

**Yes      No**

## **NEWTON STAINLESS STEEL 18" ELECTRIC TELESCOPING CHUTE - OFFICER SIDE**

The officer's side Newton Dump will be equipped with a Newton Model #5018-34, 18" electric telescoping, stainless steel dump chute. The primary switch for the chute will be adjacent to the respective dump valve switch.

A polished stainless steel cover will be provided on the officer's fender to cover the dump cutout when the chute is in the retracted position. The cover will be hinged at the top and held in position by a gas-shock stay-arm. The cover will include a switch tied into the compartment door ajar alarm circuit to notify the operator if the door does not retract properly.

## **OFFICER SIDE DUMP SWITCHING - REAR OF BODY**

The officer dump switching will be installed on the officer side of the rear body panel. The switch will be a toggle style switch installed in a protective cast enclosure with a hinged door. A light will be installed inside the enclosure to illuminate the switching area. This light will be activated whenever the vehicle marker lights are turned on.

## **OFFICER SIDE DUMP SWITCHING - IN CAB**

The officer side dump will be switched by a momentary style switch from inside the cab. The switch will be located in an area near the driver and will be a guarded style switch.

## **OFFICER SIDE CHUTE SWITCHING - REAR BODY PANEL**

The officer's side chute switching will be installed on the officer side of the rear body panel, next to the dump switch. The switch will be a toggle style switch.

## **OFFICER SIDE CHUTE SWITCHING - IN CAB**

The officer's side chute will be switched by a momentary style switch from inside the cab. The switch will be located adjacent to the respective dump switch.

## **DIRECT TANK FILL - DRIVER SIDE**

One (1) 5" Storz 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 4" Fireman's Friend (TTMA 8-bolt attachment pattern) check-type fill valve. The fill valve will be capable of flowing at a rate in excess of 1,000 gallons per minute and will be of a self deflecting design, requiring no additional diffusion device. The fill valve will be constructed of stainless steel, with a spring actuated piston-type sealing mechanism to minimize seal wear and provide positive sealing of the valve. The fill will be equipped with a 30 degree elbow terminating with a 5" Storz connection.

## **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.

# MIDDLE GROVE FIRE COMPANY

**Bidder  
Complies**

**Yes      No**

## **BODY AND COMPARTMENT FABRICATION - 3/16" ALUMINUM**

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

## **100" WIDE FIRE BODY**

The fire body will be 100" wide to provide the maximum amount of usable hose bed space, approximately 76" wide, and to extend the body fenderettes outward for better tire tread coverage. All lower compartments will be 26" deep overall, all upper compartments will be 12" deep overall.

## **SUPER STRUCTURE - ALUMINUM**

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

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

The super structure will be bolted to the sides of the chassis frame at four (4) points.

## **STEPPING, STANDING, & WALKING SURFACES**

All stepping, standing, and walking surfaces on the body will meet NFPA #1901 anti-slip standards. Aluminum tread plate utilized for stepping, standing, and walking surfaces will be ALCOA No Slip type. Upon request by the Purchaser, the manufacturer will supply proof of compliance with this requirement.

## **DRIVERS SIDE COMPARTMENTATION**

One (1) full height/split depth compartment, with a rollup door, forward of the rear wheels. Compartment dimensions 72" High x 49" Wide, with a door opening of 68" High x 46" Wide.

One (1) full height/split depth compartment, with a rollup door, behind the rear wheels. Compartment dimensions 72" High x 55" Wide, with a door opening of 68" High x 52" Wide.

One (1) high side compartment, with a rollup door, over the rear wheels. Compartment dimensions 36" High x 109" Wide, with two (2) door openings each 32" High x 50" Wide.

## **OFFICERS SIDE COMPARTMENTATION**

One (1) low side compartment, with a rollup door, forward of the rear wheels. Compartment dimensions 36" High x 49" Wide, with a door opening of 32" High x 46" Wide.

One (1) low side compartment, with a rollup door, behind the rear wheels. Compartment dimensions 36" High x 55" Wide, with a door opening of 32" High x 52" Wide.



# MIDDLE GROVE FIRE COMPANY

**Bidder  
Complies**

**Yes      No**

## **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.

## **ROBINSON ROLL-UP DOORS**

The roll-up doors will be Robinson (ROM) brand roll-up doors, equipped with a brushed aluminum finish, with a PVC inner seal to prevent metal to metal contact and to repel moisture. The slats will be double-wall extrusion 1.366" high by .315" thick with interlocking end shoes to prevent the slats from moving side-to-side and binding the door. All slats are to have interlocking joints to prevent penetration by sharp objects.

## **ROPE WITH BALL**

Rope with a ball will be provided for all driver's side roll-up doors.

## **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.

## **BEAVERTAILS**

The rear body beavertail area will be furnished with a squared off appearance to maximize the available compartment area, while providing added support to the rear step support structure. The beavertail panels will be assembled in conjunction with the rear body corner panels. This assembly will provide a vertical mounting surface for tail lights at the rear most portion of the body and additional storage space.

The inside of the beavertails will be furnished with polished aluminum tread plate overlays.

## **COMPARTMENT TOPS**

Compartment tops will be covered with polished aluminum tread plate on both sides.

# MIDDLE GROVE FIRE COMPANY

**Bidder  
Complies**

**Yes      No**

## **COMPARTMENT DRIP MOLDING**

Compartment tops over all side compartments will have a 45 degree flange formed out to provide protection against water runoff. A secondary extruded drip molding will be provided between low compartments and auxiliary high side compartments, when auxiliary compartments are provided.

## **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 in all lower compartments (if applicable) to access spring pins, 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.

## **REAR BODY PANEL**

The rear body panel will extend the full width between the beavertails. This panel will be full height from the rear step to the hose bed floor. The panel will be bolted on and removable, with no part of the rear panel attached to the booster tank. The rear body panel material will be aluminum treadplate as standard. If Chevron striping is specified for the rear of the body then smooth aluminum will be utilized.

Warning lights referenced in the warning light package Zone C - Upper will be surface mounted on the upper rear and upper rear sides of the body.

## **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 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.

# MIDDLE GROVE FIRE COMPANY

**Bidder  
Complies**

**Yes**

**No**

## **OFFICER SIDE RUNNING BOARD STORAGE WELL**

A storage well, constructed of 1/8" aluminum with a slatted aluminum bottom, 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.

One (1) hinged, latched, aluminum tread plate cover will be installed on the storage well located in the officer's side running board.

## **DRIVER SIDE RUNNING BOARD STORAGE WELL**

A storage well, constructed of 1/8" aluminum with a slatted aluminum bottom, 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.

One (1) hinged, latched, aluminum tread plate cover will be installed on the storage well located in the Driver's side running board.

## **REAR STEP**

The rear step will be sixteen (16) inches deep, with twelve (12) inches recessed between the rear portion of the rear side compartments and an additional four (4) inches extended beyond the rear of the body. The step will be fabricated from 3/16" polished aluminum tread plate, and will be rigidly reinforced. The recessed portion of the step will be 52" wide.

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

## **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.

## **REAR STEP COMPARTMENT**

One (1) rear step compartment will be provided between the frame rails. This compartment will be as tall, wide and deep as possible in the given area. This will vary based on frame width, frame height and depth of rear cross member. The compartment will have a hinged door with a D-ring handle automotive latch.

## **ILLUMINATED GRAB HANDLES WITH REFLECTIVE STRIPS**

All hand rails will be Hansen 1-1/4" outer diameter, knurled bright anodized aluminum extrusion, designed to meet NFPA 1901 requirements.

Each grab rail will have white LED lights that will wired to the DOT marker lights and interlocked to illuminate when the parking brake is applied. In addition to the LED lights, each handrail will have two (2) red diamond grade reflective strips for enhanced visibility.

Molded gaskets will be installed between the handrail stanchion castings and body surfaces to prevent electrolytic reaction between dissimilar metals and to protect paint.

# MIDDLE GROVE FIRE COMPANY

**Bidder  
Complies**

**Yes**

**No**

## **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 beavertails, one (1) each side.

One (1) horizontal, full width handrail will be installed on the rear, below the level of the hose bed.

Two (2) 18" horizontal handrails will be provided and installed one (1) on each side at rear top of body.

Two (2) **lighted with red inserts** vertical handrails will be mounted above each pump panel, (1) each side.

## **FOLDING STEP(S) - BODY FRONT DRIVER SIDE**

Cast Products model SP4401-1-CH-A-BL LED lighted large folding step(s) with RG0005 gasket, with a textured chrome plate finish will be provided on driver side body front to provide NFPA compliant access (maximum 18" height between steps) to an upper horizontal walking surface (compartment cap, dunnage area, fabricated step, or upper body compartments).

Each step will have an LED light at the top and bottom of each step to illuminate the stepping areas.

## **FOLDING STEP(S) - BODY FRONT OFFICER SIDE**

Cast Products model SP4401-1-CH-A-BL LED lighted large folding step(s) with RG0005 gasket, with a textured chrome plate finish will be provided on officer side body front to provide NFPA compliant access (maximum 18" height between steps) to an upper horizontal walking surface (compartment cap, dunnage area, fabricated step, or upper body compartments).

Each step will have an LED light at the top and bottom of each step to illuminate the stepping areas.

## **FOLDING STEP(S) - BODY REAR DRIVER SIDE**

Cast Products model SP4401-1-CH-A-BL LED lighted large folding step(s) with RG0005 gasket, with a textured chrome plate finish will be provided on driver side body rear to provide NFPA compliant access (maximum 18" height between steps) to an upper horizontal walking surface (compartment cap, dunnage area, fabricated step, or upper body compartments).

Each step will have an LED light at the top and bottom of each step to illuminate the stepping areas.

Materials and Labor costs reflect 4 steps installed on driver's side rear of body

## **FOLDING STEP(S) - BODY REAR OFFICER SIDE**

Cast Products model SP4401-1-CH-A-BL LED lighted large folding step(s) with RG0005 gasket, 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).

Each step will have an LED light at the top and bottom of each step to illuminate the stepping areas.

# MIDDLE GROVE FIRE COMPANY

**Bidder  
Complies**

**Yes      No**

Materials and labor costs reflect 4 steps installed on officers side rear of body

## **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, bolt-in, 1/8" aluminum fender liners will be provided. The wheel well liners will extend from the outer wheel well body panel, into the truck frame. Removable vertical splash shields, inward of the wheels, will be provided to give access to the hydraulic components. The completely washable fender liners will be designed to protect the front and rear compartments and main body supports from road salts, dirt accumulation and corrosion.

## **REAR FENDERETTES**

The rear fenders will be equipped with easily replaceable, polished extruded aluminum fenderettes. The fenderettes will be equipped with a rubber gasket molding between the body panel and the fenderette.

## **OFFICER REAR FENDER STORAGE**

A storage compartment will be inserted into the rear officer side body fender. The compartment will be sized large enough to store three (3) SCBA cylinders or fire extinguishers, with a maximum length of 26". The compartment will have a non-abrasive floor area for the three (3) devices. The compartment will be enclosed by a door painted to match the primary body color, with a single point latch and hinge. The back side of the door will have a section of nylatron installed to protect the door surface from the items stored in the compartment. This compartment will be tied into the compartment door ajar/do not move apparatus warning system.

## **DRIVER REAR FENDER STORAGE**

A storage compartment will be inserted into the rear driver side body fender. The compartment will be sized large enough to store two (2) SCBA cylinders or fire extinguishers, with a maximum length of 26". The compartment will have a non-abrasive floor area for the two (2) devices. The compartment will be enclosed by a door painted to match the primary body color, with a single point latch and hinge. The back side of the door will have a section of nylatron installed to protect the door surface from the items stored in the compartment. This compartment will be tied into the compartment door ajar/do not move apparatus warning system.

## **DRIVER FRONT FENDER STORAGE**

A slide out absorbent storage bin will be installed in the front driver side body fender. The storage bin will be constructed of smooth aluminum and will be sized to store a minimum of 50 lbs. of absorbent material. The bin will be installed on sliding 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. The compartment will be enclosed by a door painted to match the primary body color, with a single point latch and hinge. The back side of the door will have a section of nylatron installed to protect the door surface from the items stored in the compartment. This compartment will be tied into the compartment door ajar/do not move apparatus warning system.

# MIDDLE GROVE FIRE COMPANY

**Bidder  
Complies**

**Yes      No**

## **OFFICER FRONT FENDER STORAGE**

A slide out absorbent storage bin will be installed in the front officer side body fender. The storage bin will be constructed of smooth aluminum and will be sized to store a minimum of 50 lbs. of absorbent material. The bin will be installed on sliding 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. The compartment will be enclosed by a door painted to match the primary body color, with a single point latch and hinge. The back side of the door will have a section of nylatron installed to protect the door surface from the items stored in the compartment. This compartment will be tied into the compartment door ajar/do not move apparatus warning system.

## **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, extending through the rear body panel. The tow eyes will be made from plate steel and will be bolted directly to the chassis frame rails with grade 8 bolts. The tow eyes will be smooth and free from sharp edges, and have a minimum eyelet hole of 2-1/2". The tow eyes will be painted.

## **HOSE BED**

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.

The hose bed storage area, will have a minimum capacity of seventy-five (75) cubic feet, and will accommodate 2-1/2" or larger fire hose as required by the Purchaser. The hose bed depth will be 12".

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.

For added strength, rigidity and appearance, the hose bed side walls will have the top edge flanged outward two (2) inches and downward one (1) inch. In a similar fashion, the top edge of the front wall will be flanged inward two (2) inches and downward one (1) inch.

## **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**

One (1) fully adjustable 3/16", brushed finish, aluminum hose bed partition will be provided. Partition will be easily adjustable by means of Unistrut channels located at the front and rear of the hose bed. Partition will be removable for access to the booster tank.

## **HOSE BED COVER, VINYL WITH VELCRO**

A hose bed cover will be provided and installed. The cover will be made from 22 ounce; 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.

# MIDDLE GROVE FIRE COMPANY

**Bidder  
Complies**

**Yes**

**No**

The cover will be secured to the top front body flange with Velcro and quarter turn fasteners and will be secured to the top side body flanges with Velcro. A weighted flap will be furnished on the rear of the cover with two (2) bungee cords.

The Hypalon material will be red in color.

## \*\*\*\* COMPARTMENT ACCESSORIES \*\*\*\*

### ADJUSTABLE SHELVING

Compartment shelving will be constructed of 3/16" brush finish aluminum with a 2" upward bend at front and rear, and side supports. Shelving will be vertically adjustable with spring nuts in aluminum strut channel.

Adjustable shelves will be located as follows:

One (1) in the officer side front compartment

Two (2) in the driver side rear compartment

One (1) in the officer side rear compartment

Two (2) in the driver side rear high side compartment

### SLIDE OUT FLOOR MOUNT SHELVING

Slide out floor mount compartment shelving will be constructed of 3/16" brush finish aluminum with a 2" upward bend at front and rear, and side supports attached to #250 rated slides. Slide out floor mount shelving will have gas shocks to hold the tray in and out.

Slide out floor mount shelving will be provided as follows:

One (1) in the officer side front compartment

One (1) in the driver side rear compartment

One (1) in the officer side rear compartment

### SWING OUT TOOL BOARDS

The tool boards will be constructed of PAC TRAC Dual Faced 7040 series aluminum extrusion allowing mounting of equipment on the interior and exterior of the tool boards. The tool boards will be installed with a Performance Advantage Company PM-1000 Swing-Out Module Kit. Aluminum angles will attach the hinge to Unistrut tracking to allow depth adjustments. A heavy duty thumb latch will be provided to secure the tool boards in the closed position.

Swing out tool boards will be located as follows:

One (1) in the driver side front high side compartment

### VERTICAL PULL OUT TOOL BOARDS

Vertical pull out tool boards will be provided. Each tool board will be constructed of 3/16" smooth aluminum allowing mounting of equipment on both sides of the tool boards. Each tool board will be attached to #250 rated slides, one at the top and one at the bottom of the tool board. 3/16" aluminum angles will attach the slides to tracking to allow horizontal adjustments. A gas shock will be used to secure the tool board in the stored and deployed position.

# MIDDLE GROVE FIRE COMPANY

**Bidder  
Complies**

**Yes      No**

Vertical pull out tool boards will be located as follows:

Two (2) in the driver side front compartment

## **TURTLE TILE**

Turtle Tile brand floor material will be installed on all compartment floors. The Turtle Tile will be custom installed to provide full floor coverage.

Floor matting material will be provided on nine (9) specified shelf(s) or roll-out tray(s).

The compartment flooring color will be black.

## **\*\*\*\*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.

### **OPERATIONAL TESTING**

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.

### **HARRISON 20,000-WATT HYDRAULIC DRIVEN GENERATOR**

One (1) Harrison Hydraulic Driven Generator model number 20.0MPC-16D rated at 20000 watts, 167/83 amps, 120/240VAC, 60 Hz, 1-phase will be provided.

The system will be designed and assembled by a company with no less than 10 years experience in the manufacture of hydraulic driven generators. The system will be tested at the full nameplate load prior to shipping and be accompanied with the test report. The test report will document the generators performance at various loads from no load to full load to ensure reliable power delivery at those loads.



# MIDDLE GROVE FIRE COMPANY

**Bidder  
Complies**

**Yes      No**

The motor/generator will be placed in a frame which affords protection to the components and provides a unitized mounting module containing the motor/generator, reservoir, oil cooler, filtration, manifold containing a cross port check valve and relief valve.

The generator will be a continuous duty, industrial type with a heavy-duty bearing and of brush less design to ensure low maintenance. No brushes or slip rings will be allowed. The reservoir will include an oil level sight gauge, oil temperature gauge; fill cap, oil filter, low fluid level sensor, high temperature sensor and a venturi boost unit to provide positive pressure to the pump suction port. The generator and motor will be close coupled and aligned using a single bearing alternator design. No two (2) bearing generators will be permitted.

The system must be capable of producing the full nameplate power when driven from the vehicle PTO from idle to maximum engine speed. The generator system must be able to operate on either a Constant Engaged PTO or a Hot Shift PTO. The generator must be able to be used while vehicle is either stationary or in motion.

The hydraulic motor and pump will be of axial piston design to provide low internal leakage and a high degree of frequency stability. No gear pumps or motors will be used. The pump will match the system with the proper orifice, pressure compensator, and load sense settings to provide stable output regardless of engine rpm or electrical load demands.

The system will be capable of normal operations using a commonly available ATF fluid, such as GM Dextron III or equivalent. All fluid service points will be in close proximity to the reservoir for ease of scheduled maintenance.

When properly installed, the system will be warranted for a period of not less than two (2) years or 2000 hours, whichever should come first.

A weatherproof digital Quadra meter containing the volt, amp, and frequency will be installed near the breaker panel.

## **GENERATOR PTO**

A hot shift PTO will be provided on the transmission for the Harrison 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 two (2) year or two thousand (2000) hour warranty as provided by the generator manufacturer. A copy of the generator warranty will be provided at time of delivery.

## **GENERATOR LOCATION**

The generator will be mounted above the pump enclosure on the officer side.

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 #QO120L125G breaker panel. The breaker panel will be equipped with a properly sized main breaker using two (2) of the twenty (20) spaces which leaves a total of eighteen (18) available spaces.

# MIDDLE GROVE FIRE COMPANY

**Bidder  
Complies**

**Yes      No**

The generator output conductors will be sized to 115% of the main breaker rating and will be installed as indicated in the wiring section.

Eighteen (18) appropriately sized, 120 volt, circuit breakers will be provided.

The breaker panel will be located in an enclosed compartment as directed by the fire department.

## **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 frame 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

**MIDDLE GROVE FIRE COMPANY**

**Bidder  
Complies**

**Yes**

**No**

circuits will be wired to the breaker panel in a staggered configuration to minimize electrical loads on each breaker or generator (leg) circuit.

# MIDDLE GROVE FIRE COMPANY

**Bidder  
Complies**

**Yes      No**

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.

One (1) 120 volt, NEMA L5-15, 15 amp, duplex twist-lock receptacle with a grey thermoplastic, corrosion resistant, weatherproof cover will be installed at each side of the front bumper extension end caps. (Total of two (2))

Each receptacle will require one (1) 15 amp, 120 volt circuit breaker to be installed in the load center, for a total of two (2) breakers.

One (1) 120 volt, NEMA 5-15, 15 amp, duplex straight blade receptacle with a grey thermoplastic, corrosion resistant, weatherproof cover will be installed at each side of the pump panel. (Total of two (2))

Each receptacle will require one (1) 15 amp, 120 volt circuit breaker to be installed in the load center, for a total of two (2) breakers.

One (1) 120 volt, NEMA 5-15, 15 amp, duplex straight blade receptacle with a grey thermoplastic, corrosion resistant, weatherproof cover will be installed at each side of the of the rear body panel. (Total of two (2))

Each receptacle will require one (1) 15 amp, 120 volt circuit breaker to be installed in the load center, for a total of two (2) breakers.

## **ELECTRIC CORD REELS (220 VOLT)**

Two (2) Hannay Model #ECR-1618-17-18, with 4 conductor collector assembly for 240 volts, with 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 each reel.

The cord reels will be mounted in the rear compartments with one (1) on the driver side and one (1) on the officer side.

## **MOUNT HIGH INSIDE THE COMPARTMENTS**

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.

# MIDDLE GROVE FIRE COMPANY

**Bidder  
Complies**

**Yes      No**

## ELECTRIC CABLE

Two hundred (200) feet of Type SO yellow 10/4 heavy duty electric cable, wired for 240 volt, will be provided on each of the cord reels.

One (1) NEMA L14-30R, 30 amp, four prong twist-lock receptacle will be provided on the end of the cable.

## JUNCTION BOX(ES)

Two (2) Akron Model EJB-GFCI, four (4) outlet junction box(es) with one (1) NEMA 5-20R GFCI rated straight blade receptacle and three (3) NEMA L5-20R twist-lock receptacles with 12" pigtail with a NEMA L14-20P twist-lock plug will be provided.

The junction box(es) will be wired such that the two (2) outlets provide 120 VAC.

Two (2) Akron Electrical Junction Box will be YELLOW.

Two (2) holder(s) for the Akron EJB-EL-Hanger, Electrical Junction Box - Horizontal Mounting, of 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.

## LIGHTING (TRI-POD) - AS DIRECTED

Two (2) Fire Research Spectra model SPA656 tripod telescopic lights will be provided. The light pole will be anodized aluminum and have a knurled twist lock mechanism to secure the extension pole in position. The extension pole will extend 28" and rotate 360 degrees. An internal brake will slow the extension pole during lowering. The outer pole will be a grooved aluminum extrusion. The folding legs will be anodized aluminum tubing with plastic end caps.

The fully extended tripod system will exceed a height of 8' and be less than 5' when collapsed. Wiring will extend from the pole bottom with a 4' retractile cord.

The lights will be mounted on the rear of body one (1) each side. Wiring used for the lighting will be a minimum of 16 gauge three (3) wire cable that is properly supported and protected from damage.

Each Fire Research light will be equipped with sixty (60) ultra-bright white LEDs, 48 for flood lighting and 12 to provide a spot light beam pattern. It will operate at 120 volts AC, draw 2 amps, and generate 20,000 lumens of light. The lamphead will have a unique lens that directs flood lighting onto the work area and focuses the spot light beam into the distance. The lamphead angle of elevation will be adjustable at a pivot in the mounting arm and the position locked with a round knurled locking knob. The lamphead will be no more than 5 7/8" high by 14" wide by 3 1/2" deep and have a heat resistant handle. The lamphead and mounting arm will be powder coated. The LED scene light will be for fire service use.

The tripod lights will be equipped with a pig tail cord equipped with an L5-15 120V plug and a weatherproof "on-off" switch on the light head.

One (1) 120V, L5-15 amp receptacle will be provided and installed near the mounting position of each tripod light for a total of two (2) receptacles. Both receptacles will require one (1) 15 amp, 120V circuit breaker to be installed in the load center.

## COMMAND LIGHT, KNIGHT-2 MODEL KL415A LIGHT TOWER

The apparatus will be equipped with an all electric floodlight tower. The unit will not require tapping into vehicle braking system to be operated, eliminating the chance for vehicle brake problems.

# MIDDLE GROVE FIRE COMPANY

**Bidder  
Complies**

**Yes      No**

Hydraulic or pneumatic type floodlights are not acceptable alternatives to the all electric light tower specified.

The light tower assembly will be of aluminum construction, with stainless steel shafts and bronze bushings for long life and low maintenance. It will extend 87-1/2" above the mounting surface and will extend to full upright position in less than 15 seconds. The light tower will weigh approximately 165 pounds.

The electrically controlled unit will not require usage of the vehicle's air supply for operation, thereby eliminating the chance for air leaks in the vehicle braking system. Hydraulic or pneumatic type floodlights are not acceptable alternatives to the specified all electric light tower.

The light tower will be tested to in wind conditions of 90 mph (150 kph) minimum. Other type floodlights that have not been tested to these conditions are not acceptable.

The light tower will be capable of overhanging the side or back of the vehicle to provide maximum illumination to the vicinity adjacent to the vehicle for the safety of emergency personnel in high traffic conditions. Any tower that is only capable of rotations at the top of a pole is not an acceptable alternative to the specified tower.

The light tower will be a two-stage articulating device with a lighting bank on top of the second stage capable of continuous 360 degree rotation. The light will be elevated by electric linear actuators, one (1) actuator will elevate the lower stage and one (1) actuator will adjust the light bank angle from 0 to 110 degrees. Power for the light bank will be supplied through power collecting rings thus allowing continuous 360 degree rotation in either direction.

The tower base will have a light that illuminates the envelope of motion during any movement of the light tower mast as required by NFPA1901.

The light tower will be controlled with a hand-held 15 foot umbilical line remote control. The storage station for the remote control unit will be equipped with a button to activate the "Auto-Park" automatic nesting feature.

The controls on the remote box will be:

- Two (2) switches, one (1) for each light bank.
- One (1) light bank rotation switch.
- One (1) switch for elevating lower and upper stage.
- One (1) indicator light to indicate when light bank is out of roof nest position.
- One (1) indicator light to indicate when light bank is rotated to proper nest position.

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

Floodlight manufacturer:	Fire Research
Number of lamp heads:	Six (6) Spectra LED
Voltage:	120 volt
Watts of each lamp head:	220 watt
Total watts of light tower:	1,320 watts
Amperage per lamp head:	2 amps
Total Lumens of light tower:	120,000 lumens

The light heads will be mounted three (3) on each side of the light tower, giving two (2) vertical lines of three (3) when the lights are in the upright position.

The six (6) 150-watt light heads will require one (1) 120-volt, two pole 20-amp circuit breaker.

# MIDDLE GROVE FIRE COMPANY

**Bidder  
Complies**

**Yes**

**No**

## HAND HELD REMOTE CONTRL TO BE STORED AT PUMP PANEL.

The light tower will be mounted at the front of the hose bed.

### **PORTABLE TANK STORAGE SYSTEM**

A Zico PTS-HA "Quic-Lift" Hydraulic Portable Tank System will be provided on the officer side body compartment cap. The unit will consist of two (2) high-strength aluminum casting sets, hydraulic actuators, capable of storing a 36" high portable tank and sustain a maximum load of 500lbs. The system will be installed to accommodate the folding tank. The system will include NFPA compliant flashing lights when the tank rack is deployed. Switching will be located on the officer side pump panel in an enclosed housing, with an audible and visual alarm installed on the officer side rear body panel.

The specified portable tank storage system will be designed to carry a 3000 gallon portable water tank with approximate dimensions of 159" Long x 7" Wide x 29" Tall.

Note: If customer supplied water tank exceeds these dimensions the customer must provide tank dimensions so the tank rack can be sized properly.

### **FOLDING TANK ENCLOSURE**

The above specified portable tank storage will be enclosed on the front, rear, top, and outboard side. The top and outboard side will be 1/8" painted aluminum plate. Two (2) retaining straps will be installed on the inside of the enclosure to secure the tank inside the rack and prevent the tank from contacting the side of the body or elliptical tank.

### **THROUGH POLY WATER TANK - LADDER STORAGE**

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

A hinged access door will be provided on the enclosure that will be tied into the "Do Not Move Apparatus" warning system.

### **BACKBOARD STORAGE**

The ladder storage area will be designed to accommodate storage for a backboard, the storage slot will be sized 18" tall x 2" wide x 74" long to accommodate a standard size backboard. The storage area will have nylon material on the bottom surface to protect the backboard.

### **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**

# MIDDLE GROVE FIRE COMPANY

**Bidder  
Complies**

**Yes**

**No**

Three (3) 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 ladder storage compartment.

The pike pole tube(s) will be mounted in the suction hose storage compartment.

## **PIKE POLES**

Three (3) Fire Hooks Unlimited pike poles will be provided in the following configuration:

- 1 - Six (6) foot pike pole with fiberglass handle
- 1 - Eight (8) foot pike pole with fiberglass handle
- 1 - Ten (10) foot pike pole with fiberglass handle

These three (3) pike poles will be mounted on the ladder rack.

- One (1) 6' Fire Hooks Unlimited fiberglass handled pike pole(s) will be provided and mounted in a pike pole tube in the drivers side suction storage cabinet
- One (1) 8' Fire Hooks Unlimited fiberglass handled pike pole(s) will be provided and mounted in a pike pole tube in the drivers side suction storage cabinet.
- One (1) 10' Fire Hooks Unlimited fiberglass handled pike pole(s) will be provided and mounted in a pike pole tube in the officers side suction storage cabinet.
- One (1) 12' Fire Hooks Unlimited fiberglass handled pike pole(s) will be provided and mounted in a pike pole tube in the officers side suction storage cabinet.

## **SUCTION HOSE STORAGE**

The suction hoses will be located under the water tank one (1) on the driver side and one (1) on the officer side of the apparatus.

A hinged rear access door will be provided on the enclosure that will be tied into the "Do Not Move Apparatus" warning system.

## **SUCTION HOSE**

Two (2) 15' sections of six (6) inch Kochek (PVC) suction hose with lightweight hard coat couplings will be furnished. 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.

NOTE: All PVC suction hoses are strictly drafting hoses and must not be used on hydrants or in pressure applications, as serious personal injury or death may occur.

## **STRAINER**

One (1) 6" NST 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.

## **HYDRANT ADAPTER**

A double female swivel hydrant adapter will be provided along with a screw base mounting bracket. One end will attach to the suction hose and the other end to be 4-1/2" N.S.T. thread.



**MIDDLE GROVE FIRE COMPANY**

**Bidder  
Complies**

**Yes**

**No**

# MIDDLE GROVE FIRE COMPANY

**Bidder  
Complies**

**Yes      No**

## 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:

### HAND LIGHT

Six (6) Streamlight model 44451 orange "Fire Vulcan" C4 LED rechargeable hand light(s) and 12 volt charger will be installed as directed by the purchaser. Charger will be wired to the chassis battery system.

### HAND LIGHT

Six (6) Streamlight model 90503 orange "Survivor" LED rechargeable hand light(s) and 12 volt charger will be installed as directed by the purchaser. Charger will be wired to the chassis battery system.

### WHEEL CHOCKS

Two (2) Zico model #SAC-44 folding wheel chocks will be shipped loose and mounted as directed by the fire department.

### FOLDING WATER TANK

One (1) Husky brand 3000 gallon aluminum frame folding water tank(s) will be provided. The tank(s) when opened will measure 29" high by 159" square, and will fold to a storage size of 29" high by 7" wide by 159" long. The folding tank(s) will be equipped with 22 ounce Exlon.

The Husky Exlon liner(s) will be red in color.

### **\*\*\*\* PAINT SECTION \*\*\*\***

### PAINT, PREPARATION AND FINISH

The PPG Delta, Low V.O.C., polyurethane finishing system, or equal, will be utilized. A "Clear Coat" paint finish will be supplied to provide greater protection to the quality of the exterior paint finish.

All removable items, such as brackets, compartment doors, etc. will be painted separately to insure finish paint behind mounted items. All compartment unwelded seams exposed to high moisture environments will be sealed using permanent pliable caulking prior to finish paint.

### 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.

**MIDDLE GROVE FIRE COMPANY**

**Bidder  
Complies**

**Yes      No**

**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 PPG Delta System, prior to the installation of the body on the chassis or torque box.

**COMPARTMENT PAINT**

The interior of the body compartments will be painted with Line-X material.

The Line-X coating will be dark gray in color.

**BODY PAINT**

The body paint finish will be PPG Delta System, in a two tone configuration, 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, and 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 painted with PPG Delta system to match purchaser's furnished paint codes. A two-tone paint finish will be provided with the two-tone break line located approximately 3" below the cab side windows.

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.

# MIDDLE GROVE FIRE COMPANY

**Bidder  
Complies**

**Yes      No**

## CHASSIS PAINT

The chassis frame rails, suspension and axles will be painted black with a Polyurethane base paint prior to installation of any air lines or electric systems to ensure proper serviceability.

## WHEEL PAINT

The chassis wheels, (except aluminum wheels) will be painted job color with silver trim around the perimeter.

## PAINT CODES

The paint will match customer furnished paint code(s) and layout. The paint code(s) will be as indicated below:

- **PRIMARY PAINT COLOR**

*Single Color:    TBD                      Paint Code#    TBD*

- **SECONDARY PAINT COLOR**

*Two/Tone 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.

# MIDDLE GROVE FIRE COMPANY

**Bidder  
Complies**

**Yes      No**

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.

## **LETTERING FONT**

The lettering will be designed and cut with a basic block type font:

**"BLOCK TYPE FONT"**

## **STANDARD MALTESE CROSS DESIGN 1**

A pair of standard Maltese crosses will be computer generated and will be no larger than the 496 sq. inches available.

The standard logo will be printed on Scotch-Cal with two computer generated printed colors.

The Maltese cross will be located as directed by the Fire Department.

## **\*\*\*\* NFPA REQUIRED SCOTCH-LITE STRIPING \*\*\*\***

### **SCOTCH-LITE STRIPE**

A four (4) inch high "Scotch-Lite" stripe will be provided. The stripe will be applied on a minimum of 60 percent of each side of the unit, 60 percent on the rear of the unit and 40 percent on the front of the unit. The Scotch-Lite stripe layout will be determined by the Fire Department.

The Scotch-Lite will be white in color.

### **SCOTCH-LITE ACCENT STRIPES**

A 1" high Scotch-Lite material accent stripe will be incorporated into the Scotch-Lite scheme to border the primary Scotch-Lite stripe on the top and bottom edges. Final layout of this configuration will be determined by the Fire Department.

### **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.

### **FRONT BUMPER CHEVRON STRIPING**

The striping will be 4" diamond grade Scotch-Lite.

The Diamond Grade Scotch-Lite will be Red and Fluorescent Yellow Green in color.

# MIDDLE GROVE FIRE COMPANY

**Bidder  
Complies**

**Yes**

**No**

**\*\*\*\*\* 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 an unlimited time period.

**MIDDLE GROVE FIRE COMPANY**

**Bidder  
Complies**

**Yes**

**No**

**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.

# MIDDLE GROVE FIRE COMPANY

**Bidder  
Complies**

**Yes**

**No**

## **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 owners 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**

Hendrickson warrants suspension products manufactured by it to be free from defects in material and workmanship which occur under normal use and service for a period of one(1) year.

This warranty shall not apply and no warranty of any kind shall exist as to any product which has been subject to abuse, misuse, neglect, misapplication or accident of any type or cause or which has been repaired, replaced, substituted or used with parts other than genuine Hendrickson parts or altered by anyone.

## **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.



**MIDDLE GROVE FIRE COMPANY**

**Bidder  
Complies**

**Yes**

**No**

**WARRANTY - FIRE PUMP**

Hale Products, Incorporated ("Hale") hereby warrants to the original buyer that products manufactured by Hale shall be free of defects in material and workmanship for a period of five (5) years from the date product is first placed into service or five and one-half (5 1/2) years from date of shipment by Hale, whichever period shall be first to expire. Within this warranty period Hale will cover parts and labor for the first two (2) years and parts only for years three (3) through five (5).

**WARRANTY - FOAM SYSTEM**

The liability of FoamPro under the foregoing warranty shall be limited to the repair or replacement at FoamPro's option without charge for labor or materials of any parts upon return of the entire pump, system or other product or of the particular part to the FoamPro factory within the warranty period, at the sole expense of the purchaser, which part shall upon examination appear to FoamPro's satisfaction to have been defective in material and workmanship.

**WARRANTY - 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 two (2) year or two thousand (2000) hour warranty as provided by the generator manufacturer. A copy of the generator warranty shall be provided at time of delivery.

# MIDDLE GROVE FIRE COMPANY

**Bidder  
Complies**

**Yes      No**

## NFPA REQUIRED LOOSE EQUIPMENT, PROVIDED BY FIRE DEPARTMENT

The following loose equipment as outlined in NFPA 1901, 2009 edition in accordance with the applicable requirements, 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 7.6 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.

- 7.6.1 A minimum of 20 ft (6 m) of suction hose or 15 ft (4.5 m) of supply hose shall be carried.
- 7.6.1.1 Where suction hose is provided, a suction strainer shall be furnished.
- 7.6.1.2 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).
- 7.6.1.3 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.
- 7.6.2 Suction hose and supply hose shall meet the requirements of NFPA 1961, Standard on Fire Hose.

### Section 7.7 Minor Equipment.

7.7.2.1 The mobile water supply apparatus shall be equipped with at least 200 fl (60 m) of 2 1/2 in. (65 mm) or larger fire hose.

7.7.2.2 If the mobile water supply apparatus is equipped with a fire pump, the following shall be provided:

- (1) 400 ft (120m) of 1 1/2 (38mm), 1 3/4 in. (45mm), or 2 in. (52mm) fire hose
- (2) Two handline nozzles, 95 gpm (360 L/min) minimum. 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.

7.7.3 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) pickhead axe mounted in a bracket fastened to the apparatus
- (3) Two portable hand lights mounted in brackets fastened to the apparatus
- (4) One approved dry chemical portable fire extinguisher with a minimum 80-B:C rating mounted in a bracket fastened to the apparatus
- (5) One 2 1/2 gal (9.5 L) or larger water extinguisher mounted in a bracket fastened to the apparatus
- (6) 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 seating position. But not fewer than four, mounted in brackets fastened to the apparatus or stored in containers supplied by the SCBA manufacturer
- (7) 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
- (8) One first aid kit
- (9) Two combination spanner wrenches mounted in brackets fastened to the apparatus
- (10) One hydrant wrench mounted in brackets fastened to the apparatus
- (11) One double female 2 1/2 in. (65 mm) adapter with National Hose (NH) threads, mounted in a bracket fastened to the apparatus
- (12) One double male 2 1/2 in. (65 mm) adapter with NH threads, mounted in a bracket fastened to the apparatus

# MIDDLE GROVE FIRE COMPANY

**Bidder  
Complies**

**Yes      No**

- (13) 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
- (14) 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
- (15) Five fluorescent. orange traffic cones not less than 28 in. (711 mm) in height, each equipped with a 6 in. (152 mm) retroreflective white band no more than 4 in. (102 111m) from the top of the cone, and an additional 4 in. (102 mm) retroreflective white band 2 in. (51 mm) below the 6 in. (152 mm) hand
- (16) Five illuminated warning devices such as highway flares, unless the live fluorescent orange traffic cones have illuminating capabilities
- (17) One automatic external defibrillator (AED)

7.7.3.2 If the mobile water supply apparatus is equipped with a fire pump and none of the 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.

7.7.3.3 If the mobile water supply apparatus is equipped with a fire pump, a rubber mallet, for use on suction hose connections shall be carried in a bracket fastened to the apparatus.

7.7.3.4 If the apparatus does not have a 2 1/2 in. intake with NH threads, an adapter from 2 1/2 in. NH female to a pump intake shall be carried, mounted in a bracket fastened to the apparatus if not already mounted directly to the intake.

7.7.3.5 If the supply hose carried has other than 2 1/2 in. NH threads, adapters shall be carried to allow feeding the supply hose from a 2 1/2 in. NH thread male discharge and to allow the hose to connect to a 2 1/2 in. NH female intake, mounted in brackets fastened to the apparatus if not already mounted directly to the discharge or intake.

14.1.8.4 Fire Helmet.

It is the responsibility of the purchaser to ensure that "Fire helmets shall not be worn by persons riding in enclosed driving and crew areas any time the apparatus in placed in service.

14.1.8.4.1 A location for helmet storage shall be provided.

14.1.8.4.2 If helmets are to be stored in the driving or crew compartment, the helmets shall be secured in compliance with 14.1.11.2.

14.1.10 SCBA Mounting.

It is the responsibility of the purchaser to ensure that any SCBA equipment has been supplied and installed on the apparatus in order to achieve compliance with the standard prior to placing it in service.

14.1.10.1 Where SCBA units are mounted within a driving or crew compartment, a positive latching mechanical means of holding the SCBA device in its stowed position shall be 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 seatback, 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.

**MIDDLE GROVE FIRE COMPANY**

**Bidder  
Complies**

**Yes      No**

- 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 retroreflective 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.

**\*DEALER SUPPLIED\***

**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.

**\*DEALER SUPPLIED\***

**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.

**MIDDLE GROVE FIRE COMPANY**

**Bidder  
Complies**

**Yes**

**No**