

File No 5906 To Furnish and Deliver Qty of One (1) new. Custom Built 105' Heavy Duty Aerial Ladder  
Thursday, September 27, 2012 @ 11:00 AM

<b>Invitation for Bid</b>	<b>Bid Deposit Required</b> All bids shall be accompanied by a bid deposit in the form of a certified, treasurers check (no cash) issued by a responsible bank or trust company made payable to the City of Cambridge or a bid bond, in an amount not less than 5% of the value
FILE NO: 5906	
COMMODITY: To Furnish and Deliver qty of one (1) new Custom Built 105' Heavy Duty Aerial Ladder for the City of Cambridge Fire Department	
NAME OF BIDDER:	
BIDDER'S FED. ID.	

TO: Cynthia H. Griffin, Purchasing Agent PH: (617)349-4310 FX: (617)349-4008  
795 Massachusetts Avenue, Room 303  
Cambridge, MA 02139

The undersigned submits this sealed bid to provide the commodity or services identified above, described in the specifications herein and advertised in the **CAMBRIDGE CHRONICLE** on **THURSDAY, SEPTEMBER 13, 2012** which is to be opened and publicly read at the Office of the Purchasing Agent, City Hall, 795 Mass. Ave., Room 303, Cambridge, MA at 11:00 a.m. on **THURSDAY, SEPTEMBER 27, 2012**. This bid may be downloaded from the City's web site, [www.CambridgeMA.gov](http://www.CambridgeMA.gov), Online Services, Current Bid List, Formal, File no. 5906. Parking is limited at this location. It is strongly recommended that bids are mailed or delivered in advanced of the due date and time. Late proposals will not be accepted.

The undersigned certifies that this bid is made without collusion with any other person, firm or corporation making any other bid or who otherwise would make a bid. The undersigned agrees to furnish the commodity or services in strict accordance with the bid documents, which consist of this Invitation for Bid and all attachments hereto.

The envelope containing the bid must be labeled: "This envelope contains a bid for **To Furnish and Deliver qty of one (1) new Custom Built 105' Heavy Duty Aerial Ladder for the City of Cambridge Fire Department** opened at **11:00 A.M. on Thursday, September 27, 2012**". The bid and all documents submitted with it are public records.

All bids shall be accompanied by a bid deposit in the form of a certified, treasurers check (no cash) issued by a responsible bank or trust company made payable to the City of Cambridge or a bid bond, in an amount not less than 5% of the value of the bid.

This bid process and the award of the contract are made in conformity with M.G.L. c. 30B, unless otherwise stated.

See other side of this form for General Terms and Conditions that shall become part of any Contract awarded through this Invitation for Bid.

This bid includes addenda numbered: \_\_\_\_\_

SIGNATURE OF BIDDER: \_\_\_\_\_

TITLE OF SIGNATORY \_\_\_\_\_

ADDRESS OF BIDDER \_\_\_\_\_

TELEPHONE NUMBER \_\_\_\_\_ FAX NUMBER: \_\_\_\_\_

Please check one of the following and insert the requested information:

( ) Corporation, incorporated in the State of: \_\_\_\_\_

( ) Partnership. Names of partners: \_\_\_\_\_

( ) Individual: \_\_\_\_\_

Name of Bidder: \_\_\_\_\_

**GENERAL TERMS AND CONDITIONS**

- LAWS:** All deliveries shall conform in every respect with all applicable laws of the Federal government, Commonwealth of Massachusetts and City of Cambridge.
- EQUAL OPPORTUNITY:** The Vendor in the performance of the contract shall not discriminate on the grounds of race, color, religious creed, national origin or ancestry, age, disability, sexual orientation, marital status, family status, military status, source of income, or sex in employment practices or in the selection or retention of subcontractors, and in the procurement of materials or rental of equipment. The City may cancel, terminate or suspend the contract in whole or in part for any violation of this paragraph
- TAXES:** Purchases made by the City are exempt from the payment of Federal excise tax and the payment of Commonwealth of Massachusetts sales tax (except for gasoline) and any such taxes must not be included in the bid prices.
- QUANTITIES:** Unless otherwise stated, the quantities set forth herein are ESTIMATES ONLY. The City reserves the right to purchase the commodity(ies) specified in any amount less than the estimated amount.
- BID PRICES:** Bid prices shall include transportation and delivery charges fully prepaid to the City of Cambridge destination. Where the unit price and the total price are at variance, the unit price will prevail.
- DELIVERY AND PACKAGING:** Deliveries must be made in such quantities as called for in the purchase order and in the manufacturer's original packages. All deliveries must be "inside" delivery with no assistance from City personnel. Tailgate deliveries will not be accepted. Rejected material will be returned to the vendor at the vendor's expense.
- MODIFICATION OF BIDS:** Prior to bid opening, a bidder may correct, modify or withdraw its bid by making the request in writing prior to the time and date for the bid opening. All corrections and modifications must be delivered to the Purchasing Department in a sealed envelope indicating that it contains a modification or correction of the original bid submitted for the particular commodity and indicating the time and date of the bid opening.
- REJECTION OF BIDS:** The City reserves the right to reject any and all bids if it is in best interest of the City to do so.
- AWARD OF CONTRACT:** Contract(s) will be awarded within forty-five days of the bid opening unless award date is extended by consent of all parties concerned.
- INDEMNITY:** Unless otherwise provided by law, the Vendor will indemnify and hold harmless the City against any and all liability, loss, damages, costs or expenses for personal injury or damage to real or tangible personal property which the City may sustain, incur or be required to pay, arising out of or in connection with the performance of the Contract by reason of any negligent action/inaction or willful misconduct by the Contractor, its agents, servants or employees
- TERMINATION OF CONTRACT:** Except as otherwise provided in the Articles of Agreement, the City may terminate the contract upon seven days notice.
- ASSIGNABILITY:** The Vendor shall not assign, sell, subcontract or otherwise transfer any interest in this contract without the prior written consent of the City.
- MATERIAL SAFETY DATA SHEETS:** Pursuant to M.G.L. c. 111F, ss. 8, 9, and 10, any vendor who receives a contract resulting from this invitation agrees to submit a Material Safety Data Sheet for each toxic or hazardous substance or mixture containing such substance when deliveries are made. The vendor agrees to comply with all requirements set forth in the pertinent laws above.

Name of Bidder: \_\_\_\_\_

File No 5906 To Furnish and Deliver Qty of One (1) new. Custom Built 105' Heavy Duty Aerial Ladder  
Thursday, September 27, 2012 @ 11:00 AM

**City of Cambridge  
Purchasing Department**

TO: Cynthia H. Griffin, Purchasing Agent  
City Hall, Cambridge, Massachusetts 02139

The undersigned hereby proposes to furnish, and deliver One (1) **new Custom Built 105' Heavy Duty Aerial Ladder** for the Cambridge Fire Department, all in accordance with the attached specifications and following proposal schedule.

Prices must remain FIRM during the entire contract period. One award will be made as a result of this Invitation for Bid. The contract will be awarded to the responsive and responsible bidder offering the lowest price for the Qty of One (1) **new Custom Built 105' Heavy Duty Aerial Ladder**.

Contract will be awarded within forty-five days, unless award date is extended by consent of all parties concerned.

Prior to bid opening, a bidder may correct, modify or withdraw its bid by making the request in writing prior to the time and date for the bid opening. All corrections and modifications must be delivered to the Purchasing Department in a sealed envelope with a notation on the envelope indicating that it contains a modification or correction of the original bid submitted for the particular commodity and indicating the date and time of the bid opening.

**A sample contract is attached hereto. The bidder must be willing to sign the City's contract. The City will not accept a bidder's terms & conditions.**

**Living Wage Requirements**

The City of Cambridge has a Living Wage Requirement that establishes minimum hourly rates for all personnel providing contract services to the City. The City of Cambridge's Living Wage as of March 1, 2012 is \$14.28 per hour. The Living Wage requirements are attached.

**Attention is called to the insurance and bond requirements herein.**

**Please submit your bid in duplicate (One original and one copy). Do not submit bids in hard binders.**

**Bid Deposit**

**All bids shall be accompanied by a bid deposit in the form of a certified, treasurers check (no cash) issued by a responsible bank or trust company made payable to the City of Cambridge or a bid bond, in an amount not less than 5% of the value of the bid.**

**Performance Bond**

**The successful bidder will be required to furnish a Performance Bond in the amount of one hundred (100%) of the contract sum. Bonds shall be obtained from a surety licensed to do business in the Commonwealth of Massachusetts and the form shall be satisfactory to the City of Cambridge.**

**Proposals received from bidders who do not manufacture the chassis shall provide a warranty that shall be issued jointly and severally by, and signed by, both the bidder and the chassis manufacturer.**

**If the successful bidder does not manufacture the chassis, the bidder shall supply a separate warranty bond, in addition to their performance bond, along with their signed contract. This warranty bond shall guarantee all terms and conditions of the warranty and names both the bidder and chassis manufacturer as co-principals. This warranty bond shall be issued for the contract amount and shall remain in force for a term which is consistent with the term of the warranty quoted in the bid.**

**Questions**

**Questions concerning this Invitation to Bid including any exceptions to the specifications must be submitted in writing and faxed to Cynthia H. Griffin, Fax # 617-349-4008. All questions must be submitted no later than **Thursday, September 20 2012 by 4:00 p.m.** An addendum will be posted to the website to notify all bidders of the questions and answers.**

Name of Bidder: \_\_\_\_\_

**Please check the website for Addendums before submitting your bid to the City. Bidders will not be notified individually of Addendums.** Please check the bidders list on the website. If your firm is not listed on the bidders list please click on "Registry" and notify us that you have downloaded the bid document.

**Bid Results**

The tab sheet and the contract award information will not be mailed to the bidders individually. A tab sheet with the bid results will be posted to the website soon after the bid opening. The tab sheet will include the "contract award" information as soon as it is determined.

**Confidentiality and Public Records Law**

All bids or other materials submitted by the vendor in response to this Invitation to Bid will be open for inspection by any person and in accordance with the Massachusetts Public Records Law.

**Quality Requirements**

A "NO" response, a failure to respond, or a failure to meet any of the following Quality Requirements will result in a rejection of your bid.

Circle Yes or No for each of the following Quality Requirements.

- |  |     |    |
|--|-----|----|
| 1. Bidder has been in business for minimum of ten years.   | Yes | No |
| 2. Apparatus proposed by the bidder meets the requirements of the National Fire Protection Association (NFPA) as stated in current Pamphlet 1901 for Fire Apparatus except where amended herein. | Yes | No |
| 3. The successful bidder has and will maintain a factory authorized service center within 50 miles of the City of Cambridge Fire Headquarters located at 491 Broadway, Cambridge, MA             | Yes | No |
| 4. Bidder can provide, upon request, proof of financial solvency.  | Yes | No |
| 5. The bidder has the following qualifications:  |     |    |
| A. Minimum of eight years of continuous ownership and management.  | Yes | No |
| B. Bidder has access to sheet metal fabrication and assembly.  | Yes | No |
| C. In house paint facility large enough to accommodate Fire apparatus  | Yes | No |
| D. Certified pump mechanics.   | Yes | No |
| E. Certified welders.  | Yes | No |
| F. International air terminal within thirty mile for Receipt of air shipments of service parts.  | Yes | No |
| G. Available engineer with a minimum of 20 years experience in automotive fire apparatus and aerial design.  | Yes | No |
| H. PRO-LINK 9000 or equivalent diesel engine reader and analytical Device with ATEC Option for transmissions on Premises- owned by the service center.   | Yes | No |

Name of Bidder: \_\_\_\_\_

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**Bid Submissions**

**Failure to submit documents requested may result in the determination that your bid is non-responsive unless the City deems such failure to be a minor informality.**

1. Bidder shall furnish evidence satisfactory to the City of its ability to construct the apparatus specified and shall state the location of the factory where the apparatus is to be built.

\_\_\_\_\_ State

2. Bidder shall state minimum turn around time for repairs and parts.

3. Bidder shall submit a set of contractor's specifications consisting of a detailed description of the apparatus and equipment proposed, indicated size, type, model and make of all component parts and equipment.

4. Bidder shall provide the location of the authorized service center within 50 miles of the City of Cambridge Fire Department Headquarters located at 491 Broadway, Cambridge MA.

\_\_\_\_\_ Address City State Zip code

5. Bidder shall submit copies of certificates referenced under quality requirements 5D and 5E.
6. Bidder shall complete the specification sheets **Answer Bidder Complies yes or no for each paragraph and submit with your bid.**

**Price Proposal**

Furnish and deliver Qty of One (1) new **Custom Built 105' Heavy Duty Aerial Ladder** as per the attached specifications for the

**Delivery charge must be included in proposal price.**

All prices are to remain firm.

Total Lump Sum of

\$ \_\_\_\_\_  
Total Lump Sum

Total Lump Sum in Words: \_\_\_\_\_

Signature of Bidder: \_\_\_\_\_

**Instructions for acknowledging the attached Cambridge Fire Department Apparatus Specifications.**

**Please refer to the attached Cambridge Fire Department Apparatus Specifications and check Bidder Complies yes or no for each paragraph, sign each page of the specifications and submit with your bid.**

Name of Bidder: \_\_\_\_\_

**Americans with Disabilities Act (42 U.S.C. 12131)  
Section 504 of the Rehabilitation Act of 1973  
Tax Compliance/Anti-Collusion Statement  
Debarment Statement**

The Americans with Disabilities Act (the "Act") applies to all employers of fifteen or more employees. All vendors that are subject to the Act must comply with its provisions. In further compliance with the Act, all Contractors who enter into contracts with the City are prohibited from discrimination against the City's employees, regardless of the size of the Contractor.

The Act protects against discrimination on the basis of "disability", which is defined as a physical or mental impairment that substantially limits at least one "major life activity"; discrimination against a person having a history or record of such impairment; and discrimination against an individual regarded - even if inaccurately - as having such an impairment. The Act also expressly prohibits discrimination that is based on an individual's relationship or association with a disabled person.

The Contractor shall not discriminate against any qualified employee or job applicant with a disability and will make the activities, programs and services covered by any contract awarded through this procurement readily accessible to and usable by individuals with disabilities. To be qualified for a job, or to avail oneself of the Contractor's services, the individual with the disability must meet the essential eligibility requirements for receipt of the Contractor's services or participation in the Contractor's programs or activities with or without: 1) reasonable modifications to the Contractor's rules, policies and practices; 2) removal of architectural, communication, or transportation barriers; or, 3) provisions of auxiliary aids and services.

By submitting its contract, the Contractor certifies to the City of Cambridge that it understands and will comply with all applicable provisions of the Act, including compliance with applicable provisions of Section 504 of the Rehabilitation Act of 1973, if the Contractor is receiving federal funds.

The undersigned certifies under penalties of perjury that this contract has been made and submitted in good faith and without collusion or fraud with any other person. As used in this certification, the "person" shall mean any natural person, business, partnership, corporation, union, committee, club, or other organization, entity, or group of individuals

As required by M.G.L. c. 62C, §49A, the undersigned certifies under the penalties of perjury that the Contractor has complied with all laws of the commonwealth relating to taxes, reporting of employees and contractors, and withholding and remitting child support.

The undersigned certifies that it is not currently subject to any State or Federal debarment order.

Date: \_\_\_\_\_

\_\_\_\_\_  
(Print Name of person signing bid)

\_\_\_\_\_  
(Signature & Title)

**This form must be submitted with your bid**

Name of Bidder: \_\_\_\_\_

### CORI COMPLIANCE FORM

Persons and businesses supplying goods and/or services to the City of Cambridge ("Vendors"), who are required by law to perform CORI checks, are further required by Section 2.112.060 of the Cambridge Municipal Code to employ fair policies, practices and standards relating to the screening and identification of persons with criminal backgrounds through the CORI system. Such Vendors, when entering into contracts with the City of Cambridge, must affirm that their policies, practices and standards regarding CORI information are consistent with the policies, practices and standards employed by the City of Cambridge as set forth in the City of Cambridge CORI Policy ("CORI Policy") attached hereto.

#### CERTIFICATION

The undersigned certifies under penalties of perjury that the Vendor employs CORI related policies, practices and standards that are consistent with the provisions of the attached CORI Policy. **All Vendors must check one of the three lines below.**

1. \_\_\_\_\_ CORI checks are not performed on any Applicants.
2. \_\_\_\_\_ CORI checks are performed on some or all Applicants. The Vendor, by affixing a signature below, affirms under penalties of perjury that its CORI policies, practices and standards are consistent with the policies, practices and standards set forth in the attached CORI Policy.
3. \_\_\_\_\_ CORI checks are performed on some or all Applicants. The Vendor's CORI policies, practices and standards are not consistent with the attached CORI Policy. Please explain on a separate sheet of paper.

\_\_\_\_\_  
(Typed or printed name of person  
signing quotation, bid or Proposal)

\_\_\_\_\_  
Signature

\_\_\_\_\_  
(Name of Business)

**NOTE:**

The City Manager, in his sole discretion may grant a waiver to any Vendor on a contract by contract basis.

**Instructions for Completing CORI Compliance Form:**

A Vendor should not check Line 1 unless it performs NO CORI checks on ANY applicant. A Vendor who checks Line 2 certifies that the Vendor's CORI policy conforms to the policies, practices and standards set forth in the City's CORI Policy. A Vendor with a CORI policy that does NOT conform to the City's CORI Policy must check Line 3 and explain the reasons for its nonconformance in writing. Vendors, who check Line 3, will not be permitted to enter into contracts with the City, absent a waiver by the City Manager.

**This form must be submitted with your bid**

Name of Bidder: \_\_\_\_\_

Cambridge Fire Department Apparatus Specification	Bidder Complies	
	Yes	No
<p style="text-align: center;"><b>Cambridge Fire Department</b> 491 Broadway Cambridge, Massachusetts 02138</p> <p style="text-align: center;"><b>SPECIFICATIONS FOR A CUSTOM BUILT 105' HEAVY DUTY AERIAL LADDER</b></p> <p><b><u>INTENT OF SPECIFICATIONS</u></b></p> <p>It shall be the intent of these specifications to cover the furnishing and delivery of a complete fire apparatus. These detailed specifications shall cover the requirements as to the type of construction and test to which the apparatus shall conform, together with certain details as to finish, equipment and appliances with which the successful bidder shall conform. Minor details of construction and materials, which are not otherwise specified, are left to the discretion of the contractor. The manufacturer shall provide loose equipment only when specified by the customer. Otherwise, in accordance with the current edition of NFPA 1901 standards, the proposal shall specify whether the fire department or apparatus dealership shall provide required loose equipment.</p> <p>In order to ensure fair, ethical, and legal competition, neither original equipment manufacturer (O.E.M.) or 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. (No exception).</p> <p>Bids shall only be considered from companies that have an established reputation in the field of fire apparatus construction and have been in business for a minimum of 20 years. Further, bidder shall maintain dedicated service facilities for the repair and service of products. Evidence of such a facility shall be included in bidder proposal.</p> <p>Each bidder shall furnish satisfactory evidence of their ability to construct the apparatus specified and shall state the location of the factory where the apparatus is to be built. The bidder shall also show that the company is in position to render prompt service and to furnish replacement parts.</p> <p>Each bid shall be accompanied by a detailed set of Contractor's Specifications consisting of a detailed description of the apparatus and equipment proposed, and to which the apparatus furnished under contract shall conform. These specifications shall indicate size, type, model and make of all component parts and equipment.</p> <p><b><u>QUALITY AND WORKMANSHIP</u></b></p> <p>The design of the apparatus shall embody the latest approved automotive engineering practices. The workmanship shall be of the highest quality in its respective field. Special consideration shall be given to the following points: Accessibility of the various units that require periodic maintenance; ease of operation and symmetrical proportions. Construction shall be rugged and ample safety factors shall be provided to carry the loads specified and to meet both on and off road requirements and speed conditions as set forth under</p>		

Cambridge Fire Department Apparatus Specification	Bidder Complies	
	Yes	No
<p>Performance Tests and Requirements. Welding shall not be employed in the assembly of the apparatus in a manner that shall prevent the ready removal of any component part for service or repair. All steel welding shall follow American Welding Society D1.1-2004 recommendations for structural steel welding. All aluminum welding shall follow American Welding Society and ANSI D1.2-2003 requirements for structural welding of aluminum. All sheet metal welding shall follow American Welding Society B2.1-2000 requirements for structural welding of sheet metal. Flux core arc welding to use alloy rods, type 7000, American Welding Society standards A5.20-E70T1. Employees classified as welders are tested and certified to meet American Welding Society codes upon hire and every three (3) years thereafter. The manufacturer shall be required to have an American Welding Society certified welding inspector in plant during working hours to monitor weld quality.</p> <p><b><u>DELIVERY</u></b>  Apparatus, to insure proper break in of all components while still under warranty, <b>shall be delivered under its own power</b> - rail or truck freight shall not be acceptable. A qualified delivery engineer representing the contractor shall deliver the apparatus and remain for a sufficient length of time to instruct personnel in the proper operation, care and maintenance of the equipment delivered.</p> <p><b><u>INFORMATION REQUIRED</u></b>  The manufacturer shall supply at time of delivery, complete operation and maintenance manuals covering the completed apparatus as delivered. A permanent plate shall be mounted in the driver's compartment which specifies the quantity and type of fluids required including engine oil, engine coolant, transmission, pump transmission lubrication, pump primer and drive axle.</p> <p><b><u>SAFETY VIDEO</u></b>  Documentation provided at the time of delivery shall also include an apparatus safety video, in DVD format. This video shall address key safety considerations for personnel to follow when they are driving, operating, and maintaining the apparatus. Safety procedures for the following shall be included: vehicle pre-trip inspections, chassis operation, aerial operation, and maintenance.</p> <p><b><u>PERFORMANCE TESTS AND REQUIREMENTS</u></b>  A road test shall be conducted with the apparatus fully loaded and a continuous run of ten (10) miles or more shall be made under all driving conditions, during which time the apparatus shall show no loss of power or overheating. The transmission drive shaft or shafts, and rear axles shall run quietly and be free from abnormal vibration or noise throughout the operating range of the apparatus. Vehicle shall adhere to the following parameters:</p>		

<b>Cambridge Fire Department Apparatus Specification</b>	Bidder Complies	
	Yes	No
<p>A) The apparatus, when fully equipped and loaded, shall have not less than 25 percent nor more than 50 percent of the weight on the front axle, and not less than 50 percent nor more than 75 percent on the rear axle.</p> <p>B) The apparatus shall be capable of accelerating to 35 mph from a standing start within 25 seconds on a level concrete highway without exceeding the maximum governed rpm of the engine.</p> <p>C) The service brakes shall be capable of stopping a fully loaded vehicle in 35 feet at 20 mph on a level concrete highway. The air brake system shall conform to Federal Motor Vehicle Safety Standards (FMVSS) 121.</p> <p>D) The apparatus, fully loaded, shall be capable of obtaining a speed of 50 mph on a level concrete highway with the engine not exceeding its governed rpm (full load).</p> <p><b><u>FAILURE TO MEET TEST</u></b>            In the event the apparatus fails to meet the test requirements of these specifications on the first trial, second trials may be made at the option of the bidder within 30 days of the date of the first trial. Such trials shall be final and conclusive and failure to comply with these requirements shall be cause for rejection. Failure to comply with changes to conform to any clause of the specifications, within 30 days after notice is given to the bidder of such changes, shall also be cause for rejection of the apparatus. Permission to keep or store the apparatus in any building owned or occupied by the purchaser or its use by the purchaser during the above-specified period with the permission of the bidder shall not constitute acceptance.</p> <p><b><u>LIABILITY</u></b>            The successful bidder shall defend any and all suits and assume all liability for the use of any patented process including any device or article forming a part of the apparatus or any appliance furnished under the contract.</p> <p><b><u>SPECIFICATION BID REQUIREMENTS</u></b>            Bidders shall also indicate in the "yes/no" column if their bid complies <b>on each item</b> (PARAGRAPH) specified. Exceptions shall be allowed if they are equal to or superior to that specified and provided they are listed and fully explained on a separate page.</p> <p><b>Proposals taking total exception to specifications shall not be acceptable.</b></p> <p>Also, bidders shall submit a detailed proposal. A letter only, even though written on a company letterhead, shall not be sufficient. Bid proposals shall be submitted in the same sequence as specifications for ease of evaluation, comparison and checking of compliance. <b>An exception to these requirements shall not be tolerated.</b></p>		

# Cambridge Fire Department Apparatus Specification

Bidder  
Complies

Yes No

## EXCEPTIONS

All exceptions shall be stated no matter how seemingly minor. Any exceptions not taken shall be assumed by the purchaser to be included in the proposal, regardless of the cost to the bidder.

## GENERAL CONSTRUCTION

The apparatus shall be designed with due consideration to distribution of load between the front and rear axles. Weight balance and distribution shall be in accordance with the recommendations of the National Fire Protection Association.

## COMMERCIAL GENERAL LIABILITY INSURANCE

The successful bidder shall, during the performance of the contract and for three (3) years following acceptance of the product, keep in force at least the following minimum limits of commercial general liability insurance:

Each Occurrence	\$1,000,000
Products/Completed Operations Aggregate	\$1,000,000
Personal and Advertising Injury	\$1,000,000
General Aggregate	\$5,000,000

Coverage shall be written on a Commercial General Liability form. The policy shall be written on an occurrence form and shall include Contractual Liability coverage for bodily injury and property damage subject to the terms and conditions of the policy. The policy shall include Owner as an additional insured when required by written contract.

## COMMERCIAL AUTOMOBILE LIABILITY INSURANCE

The successful bidder shall, during the performance of the contract keep in force at least the following minimum limits of commercial automobile liability insurance:

Each Accident Combined Single Limit:	\$1,000,000
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Coverage shall be written on a Commercial Automobile liability form.

## UMBRELLA/EXCESS LIABILITY INSURANCE

The successful bidder shall, during the performance of the contract and for three (3) years following acceptance of the product, keep in force at least the following minimum limits of umbrella liability insurance:

Aggregate: \$25,000,000

Each Occurrence: \$25,000,000

The umbrella policy shall be written on an occurrence basis and at a minimum provide excess to the Bidder's General Liability, Automobile Liability and Employer's Liability policies.

Cambridge Fire Department Apparatus Specification	Bidder Complies	
	Yes	No
<p>The required limits can be provided by one (1) or more policies provided all other insurance requirements are met.</p> <p>Coverage shall be provided by a carrier(s) rated A- or better by A.M. Bests.</p> <p>All policies shall provide a 30 day notice of cancellation to the named insured. The Certificate of Insurance shall provide the following cancellation clause: Should any of the above described polices be cancelled before the expiration date thereof, notice shall be delivered in accordance with the policy provisions. Bidder agrees to furnish owner with a current Certificate of Insurance with the coverage's listed above along with its bid. The certificate shall show the purchaser as certificate holder.</p> <p><b><u>ISO COMPLIANCE</u></b></p> <p><b>The manufacturer shall operate a Quality Management System under the requirements of ISO 9001. These standards sponsored by the International Organization for Standardization (ISO) specify the quality systems that shall be established by the manufacturer for design, manufacture, installation and service. A copy of the certificate of compliance shall be included with the bid.</b></p> <p><b><u>NFPA 2009 STANDARDS</u></b></p> <p>This unit shall comply with the NFPA standards effective January 1, 2009, except for fire department specifications that differ from NFPA specifications. These exceptions shall be set forth in the Statement of Exceptions.</p> <p>Certification of slip resistance of all stepping, standing and walking surfaces shall be supplied with delivery of the apparatus.</p> <p>A plate that is highly visible to the driver while seated shall be provided. This plate shall show the overall height, length, and gross vehicle weight rating.</p> <p>The manufacturer shall have programs in place for training, proficiency testing and performance for any staff involved with certifications.</p> <p>An official of the company shall designate, in writing, who is qualified to witness and certify test results.</p> <p><b><u>NFPA COMPLIANCY</u></b></p> <p>Apparatus proposed by the bidder shall meet the applicable requirements of the National Fire Protection Association (NFPA) as stated in current edition at time of contract execution. Fire department's specifications that differ from NFPA specifications shall be indicated in the proposal as "non-NFPA".</p> <p><b><u>INSPECTION CERTIFICATE</u></b></p> <p>A third party inspection certificate for the aerial device shall be furnished upon delivery of the aerial device. The certificate shall be Underwriters Laboratories</p>		

<b>Cambridge Fire Department Apparatus Specification</b>	Bidder Complies	
	Yes	No
<p>Inc. Type 1 and shall indicate that the aerial device has been inspected on the production line and after final assembly.</p> <p>The following tests shall be conducted:</p> <ul style="list-style-type: none"> <li>- Magnetic particle inspection shall be conducted on every structural weld to assure the integrity of the weldments and to detect any flaws or weaknesses. Magnets shall be placed on each side of the weld while iron powder is placed on the weld itself. The powder shall detect any crack that may exist. This test shall conform to ASTM E709 and be performed prior to assembly of the aerial device.</li> <li>- With aluminum structural components, visual inspection shall be performed on aluminum surfaces (non-magnetic). A liquid penetrant test shall be performed on any suspected defective area. This test shall conform to ASTM E165 and be performed prior to assembly of the aerial device.</li> <li>- Ultrasonic inspection shall be used to detect any flaws in pins, bolts and other critical mounting components.</li> </ul> <p>Functional tests, load tests, stability tests, and visual structural examinations shall be performed. These tests shall determine any unusual deflection, noise, vibration, or instability characteristics of the unit.</p> <p><b><u>VEHICLE INSPECTION PROGRAM CERTIFICATION</u></b>  <b>The apparatus shall be third-party, independent, audit-certified through Underwriters Laboratory (UL) to the current edition of NFPA 1901 standards. The certification includes: all design, production, operational and performance testing of the apparatus. (No exception)</b></p> <p><b><u>GENERATOR TEST</u></b>          If the unit has a generator, the generator shall be tested, approved, and certified by Underwriters Laboratories at the manufacturer's expense. The test results shall be provided to the Fire Department at the time of delivery.</p> <p><b><u>BREATHING AIR TEST</u></b>          If the unit has breathing air, the apparatus manufacturer shall draw an air sample from the air system and certify that the air quality meets the requirements of NFPA 1989, <i>Standard on Breathing Air Quality for Fire and Emergency Services Respiratory Protection</i>.</p> <p><b><u>REQUIREMENTS OF THE APPARATUS MANUFACTURER</u></b>          The manufacturer of the apparatus must be fully owned and managed by a Parent Company, Corporation, Partnership, or that is a company 100% held in the United States of America.</p> <p>Proposals from any manufacturer that is fully or partially owned and/or operated by a Foreign Company, Corporation, Partnership, or that is a company</p>		

# Cambridge Fire Department Apparatus Specification

Bidder  
Complies

Yes

No

under any type of ownership, partnership, or any similar type of agreement shall be rejected immediately and their bid disqualified. (NO EXCEPTIONS).

## INSPECTION TRIP(S)

The bidder shall provide two (2) factory inspection trip(s) for three (3) members of the Cambridge Fire Department. The inspection trip(s) shall be scheduled at times mutually agreed upon between the manufacturer's representative and the customer. All costs such as travel, lodging and meals shall be the responsibility of the bidder.

## SERVICE CENTER

In order to minimize out of service time the bidder shall have the capability to repair all major components with-out the need to transport the apparatus to other locations. The bidder shall maintain a factory authorized service center with-in 50 miles of the Cambridge Fire Department. The service center shall have the following minimum qualifications:

1. Minimum 10 years of continuous ownership and management
2. Total in-house body shop capability
3. Minimum 40 foot down draft paint booth with environmental approval
4. Pump mechanics certified by the pump manufacturer
5. Automotive electricians trained by the apparatus factory
6. PRO-LINK 9000 analytical device with current software
7. Lap top shop computer with current multiplex analytical software and wireless modem for direct truck to factory communication
8. Full time body repair and automotive paint staff
9. Certified Master ASE and EVT Technicians
10. Warranty center for International Harvester®, Ford®, Caterpillar®, Cummins®, Allison® Transmission, Hendrickson®, Meritor®, Waterous® and Hale® Pumps
11. Computerized parts listing
12. Aerial and hydraulic repair specialists
13. 24 Hour Road & Towing service vehicle
14. VIS® Check Diagnostic analyzer for driveline inspections
15. DOT & Massachusetts Inspection Station
16. Hunter® Laser Truck Alignment System
17. Robinair® Air Conditioning Analyzer
18. Massachusetts Certified Air Conditioning Technician

**Current Certifications shall be furnished at time of bid (NO EXCEPTIONS).**

## TRAINING

**A qualified training engineer shall be provided by the bidder. The training engineer shall instruct the Cambridge Fire Department personnel in the operation and maintenance of the chassis, and aerial operation for a period of not less than four (4) days. The training shall incorporate modern training techniques. An "as built" Power Point® presentation**

Cambridge Fire Department Apparatus Specification	Bidder Complies	
	Yes	No
<p>shall be included as part of the instruction. A copy shall be left with the fire department to use for future instruction.</p> <p><b><u>CONTRACT</u></b>  The contract for the specified apparatus shall be directly with the City of Cambridge, Massachusetts and the manufacturer. Contracts with dealers or representatives of the manufacturer will not be executed.</p> <p><b><u>NEW AND UNUSED</u></b>  All components shall be new and unused (with the exception of use incidental to the construction, testing, transport and delivery of the apparatus). Any old or used components shall constitute grounds for automatic rejection of the entire apparatus.</p> <p>Bidders must identify by manufacturer and model number purchased components utilized in the apparatus proposed in the bid submission. In order to make valid comparisons between bids, components must be accurately identified. Therefore any bid or technical proposal which does not so identify the components being offered will not be considered.</p> <p><b>Any potential to utilize progress payment discounts must be defined clearly in the ("bidder's) proposal.</b></p> <p><b><u>AFTERMARKET SUPPORT WEBSITE</u></b>  A Customer Service website shall provide authorized dealers access to comprehensive information pertaining to the maintenance and service of their customer's apparatus. This tool shall provide the authorized dealer the ability to service and support their customers to the best of their ability with factory support at their fingertips.</p> <p>This website shall also be accessible to the end user through the guest login. Limited access is available and vehicle specific parts information accessible by entering a specific VIN number. All end users should see their local authorized dealer for additional support and service.</p> <p>The website shall provide the following to the designated individuals:</p> <ul style="list-style-type: none"> <li>- Authorized dealer only - ability to access truck detail information on the major components of the vehicle, warranty information, available vehicle photographs, vehicle drawings, sales options, applicable vehicle software downloads, etc.</li> <li>- Authorized dealer and customer - parts look-up capability, with the aid of digital photographs, part drawings, and assembly drawings.</li> <li>- Authorized dealer only - ability to electronically submit warranty claims directly to the factory for reimbursement.</li> <li>- Authorized dealer only - accessibility to multiple dealer reports that allow the dealership to maintain communication with the customer on the status of orders, claims, and phone contacts.</li> </ul>		

# Cambridge Fire Department Apparatus Specification

Bidder  
Complies

Yes	No
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- Authorized dealer and customer - access to all currently published Operation and Maintenance and Service publications.
- Authorized dealer only - access to manufacturer Service Bulletins and Work Instructions containing information on current service topics and recommendations provided.
- Authorized dealer and customer - access to upcoming training classes offered by the manufacturer.
- Authorized dealer only - access to interactive electronic learning modules (Operators Guides) covering the operation of major vehicle components.
- Authorized dealer only - access to customer service articles, corporate news, quarterly newsletters, and key contacts.

**BID BOND**

All bidders shall provide a bid bond as security for the bid in the form of a 5% bid bond to accompany their bid. This bid bond shall be issued by a Surety Company who is listed on the U.S. Treasury Departments list of acceptable sureties as published in Department Circular 570. The bid bond shall be issued by an authorized representative of the Surety Company and shall be accompanied by a certified power of attorney dated on or before the date of bid. The bid bond shall include language, which assures that the bidder/principal shall give a bond or bonds as may be specified in the bidding or contract documents, with good and sufficient surety for the faithful performance of the contract, including the Basic One (1) Year Limited Warranty, and for the prompt payment of labor and material furnished in the prosecution of the contract.

Proposals received from bidders who do not manufacture the chassis shall provide a warranty that shall be issued jointly and severally by, and signed by, both the bidder and the chassis manufacturer.

If the successful bidder does not manufacture the chassis, the bidder shall supply a warranty bond, in addition to their performance bond, along with their signed contract. This warranty bond shall guarantee all terms and conditions of the Basic One (1) Year Limited Warranty and names both the bidder and chassis manufacturer as co-principals. This warranty bond shall be issued for the contract amount and shall remain in force for a term which is consistent with the term of the Basic One (1) Year Limited Warranty.

Notwithstanding any document or assertion to the contrary, any surety bond related to the sale of a vehicle shall apply only to the Basic One (1) Year Limited Warranty for such vehicle. Any surety bond related to the sale of a vehicle shall not apply to any other warranties that are included within this bid (OEM or otherwise) or to the warranties (if any) of any third party of any part, component, attachment or accessory that is incorporated into or attached to the vehicle. In the event of any contradiction or inconsistency between this provision and any other document or assertion, this provision shall prevail.

# Cambridge Fire Department Apparatus Specification

Bidder Complies	
Yes	No

**PERFORMANCE BOND, 1 YEAR**

The successful bidder shall furnish a Performance and Payment bond (Bond) equal to 100 percent of the total contract amount within 30 days of the notice of award. Such Bond shall be in a form acceptable to the Owner and issued by a surety company included within the Department of Treasury's Listing of Approved Sureties (Department Circular 570) with a minimum A.M. Best Financial Strength Rating of A and Size Category of XV. In the event of a bond issued by a surety of a lesser Size Category, a minimum Financial Strength rating of A+ is required.

Bidder and Bidder's surety agree that the Bond issued hereunder, whether expressly stated or not, also includes the surety's guarantee of the vehicle manufacturer's Basic One (1) Year Limited Warranty period included within this proposal. Owner agrees that the penal amount of this bond shall be simultaneously amended to 100% percent of the total contract amount upon satisfactory acceptance and delivery of the vehicle(s) included herein. Notwithstanding anything contained within this contract to the contrary, the surety's liability for any warranties of any type shall not exceed one (1) year from the date of such satisfactory acceptance and delivery, or the actual Basic One (1) Year Limited Warranty period, whichever is shorter.

**APPROVAL DRAWING**

A drawing of the proposed apparatus shall be provided for approval before construction begins. The sales representative shall also have a copy of the same drawing. The finalized and approved drawing shall become part of the contract documents. This drawing shall indicate the chassis make and model, location of the lights, siren, horns, compartments, major components, etc.

A "revised" approval drawing of the apparatus shall be prepared and submitted by the manufacturer to the purchaser showing any changes made to the approval drawing.

**WARRANTIES**

The following minimum warranties shall be included by the bidder. Copies of each certificate shall be furnished at time of bid submission.

**ONE (1) YEAR MATERIAL AND WORKMANSHIP**

Each new piece of apparatus shall be provided with a minimum one (1) year basic apparatus material and workmanship limited warranty. The warranty shall cover such portions of the apparatus built by the manufacturer as being free from defects in material and workmanship that would arise under normal use and service.

**The Cambridge Fire Department will perform warranty repairs at warranty rates with prior approval from the manufacturer.**

A copy of the warranty certificate shall be submitted with the bid package. (No exception).

Cambridge Fire Department Apparatus Specification	Bidder Complies	
	Yes	No
<p><b><u>FIFTY (50) YEAR STRUCTURAL INTEGRITY</u></b>  The chassis frame shall be provided with a fifty (50) year material and workmanship limited warranty. The warranty shall cover the chassis frame as being free from defects in material and workmanship that would arise under normal use and service.</p> <p>A copy of the warranty certificate shall be submitted with the bid package. (No exception).</p>		
<p><b><u>FRONT AXLE THREE (3) YEAR MATERIAL AND WORKMANSHIP WARRANTY</u></b>  Independent front suspension shall be provided with a three (3) year material and workmanship limited warranty. The manufacturer's warranty shall provide that the independent front suspension and steering gears be free from any defect related to material and workmanship on the portion of the apparatus built by the manufacturer that would arise under normal use and service. A copy of the warranty certificate shall be submitted with the bid package (No Exception).</p>		
<p><b><u>STEERING GEAR WARRANTY</u></b>  A Sheppard three (3) year limited steering gear warranty shall be provided. A copy of the warranty certificate shall be submitted with the bid package.</p>		
<p><b><u>REAR AXLE TWO (2) YEAR MATERIAL AND WORKMANSHIP WARRANTY</u></b>  A Meritor™ Axle 2 year limited warranty shall be provided.</p>		
<p><b><u>ENGINE WARRANTY</u></b>  A Detroit Diesel five (5) year limited engine warranty shall be provided. A copy of the warranty certificate shall be submitted with the bid package.</p>		
<p><b><u>TRANSMISSION WARRANTY</u></b>  The transmission shall have a <b>five (5) year/unlimited mileage</b> warranty covering 100 percent parts and labor. The warranty is to be provided by Allison Transmission and not the apparatus builder.</p>		
<p><b><u>FIVE (5) YEAR MATERIAL AND WORKMANSHIP</u></b>  The electronic modules and display(s) shall be provided with a five (5) year material and workmanship limited warranty. The warranty shall cover electronic modules to be free from failures caused by defects in material and workmanship.</p> <p>A copy of the warranty certificate shall be submitted with the bid package (No Exception).</p>		
<p><b><u>TEN (10) YEAR STRUCTURAL INTEGRITY</u></b>  The new cab shall be provided with a ten (10) year material and workmanship limited warranty. The warranty shall cover such portions of the cab built by the</p>		

## Cambridge Fire Department Apparatus Specification

Bidder  
Complies

Yes No

manufacturer as being free from structural failures caused by defects in material and workmanship that would arise under normal use and service.

A copy of the warranty certificate shall be submitted with the bid package (No Exception).

### **TEN (10) YEAR STRUCTURAL INTEGRITY**

Each new piece of apparatus shall be provided with a ten (10) year material and workmanship limited warranty on the apparatus body. The warranty shall cover such portions of the apparatus built by the manufacturer as being free from defects in material and workmanship that would arise under normal use and service.

A copy of the warranty certificate shall be submitted with the bid package (No Exception).

### **ROLL UP DOOR MATERIAL AND WORKMANSHIP WARRANTY**

A Gortite roll-up door limited warranty shall be provided. The mechanical components of the roll-up door shall be warranted against defects in material and workmanship for the lifetime of the vehicle. A six (6) year limited warranty shall be provided on painted and satin roll up doors.

A copy of the warranty certificate shall be submitted with the bid package.

### **TWENTY (20) YEAR AERIAL DEVICE STRUCTURAL INTEGRITY WARRANTY**

The aerial device shall be provided with a twenty (20) year material and workmanship limited warranty. The warranty shall cover such portions of the apparatus built by the manufacturer as being free from defects in material and workmanship that would arise under normal use and service. This warranty shall be limited to the torque box, turntable, aerial sections and other structural components.

A copy of the warranty certificate shall be submitted with the bid package (No Exception).

### **AERIAL SWIVEL WARRANTY**

An Amity five (5) year limited swivel warranty shall be provided. A copy of the warranty certificate shall be submitted with the bid package (no exception).

### **HYDRAULIC SYSTEM COMPONENTS WARRANTY**

Aerial hydraulic system components shall be provided with a five (5) year material and workmanship limited warranty.

### **HYDRAULIC SEAL WARRANTY**

Aerial hydraulic seals shall be provided with a three (3) year material and workmanship limited warranty.

Cambridge Fire Department Apparatus Specification	Bidder Complies	
	Yes	No
<p>A copy of the warranty certificates shall be submitted with the bid package (no exception).</p> <p><b><u>AERIAL WATERWAY WARRANTY</u></b>  An Amity ten (10) year limited waterway warranty shall be provided. A copy of the warranty certificate shall be submitted with the bid package (no exception).</p> <p><b><u>FOUR (4) YEAR PRO-RATED PAINT AND CORROSION</u></b>  The aerial device shall be provided with a four (4) year pro-rated paint and corrosion limited warranty. The warranty shall cover exterior painted surfaces of the aerial device to be free from blistering, peeling, corrosion, or any other adhesion defect caused by defective manufacturing methods or paint material selection that would arise under normal use and service.</p> <p>A copy of the warranty certificate shall be submitted with the bid package (No Exception).</p> <p><b><u>TEN (10) YEAR PAINT AND CORROSION NON PRO-RATED</u></b>  Each new piece of apparatus shall be provided with a ten (10) year paint and corrosion limited warranty on the apparatus cab. The warranty shall cover painted exterior surfaces of the body to be free from blistering, peeling, corrosion, or any other adhesion defect caused by defective manufacturing methods or paint material selection that would arise under normal use and service.</p> <p>A copy of the warranty certificate shall be submitted with the bid package (No Exception).</p> <p><b><u>TWELVE (12) YEAR PAINT AND CORROSION NON PRO-RATED</u></b>  Each new piece of apparatus shall be provided with a twelve (12) year paint and corrosion limited warranty on the apparatus body. The warranty shall cover painted exterior surfaces of the body to be free from blistering, peeling, corrosion, or any other adhesion defect caused by defective manufacturing methods or paint material selection that would arise under normal use and service.</p> <p>A copy of the warranty certificate shall be submitted with the bid package (No Exception).</p> <p><b><u>THREE (3) YEAR MATERIAL AND WORKMANSHIP</u></b>  The gold leaf lamination shall be provided with a three (3) year material and workmanship limited warranty. The warranty shall cover the gold leaf lamination as being free from defects in material and workmanship that would arise under normal use and service.</p> <p>A copy of the warranty certificate shall be submitted with the bid package (No Exception).</p>		

<b>Cambridge Fire Department Apparatus Specification</b>	Bidder Complies	
	Yes	No
<p><b><u>CERTIFICATIONS</u></b> The following certifications shall be furnished with the bid documents.</p> <p><b><u>VEHICLE STABILITY CERTIFICATION</u></b> The fire apparatus manufacturer shall provide a certification stating the apparatus complies with NFPA 1901, current edition, section 4.13, Vehicle Stability. The certification shall be provided at the time of bid.</p> <p><b><u>ENGINE INSTALLATION CERTIFICATION</u></b> The fire apparatus manufacturer shall provide a certification, along with a letter from the engine manufacturer stating they approve of the engine installation in the bidder's chassis. The certification shall be provided at the time of bid.</p> <p><b><u>POWER STEERING CERTIFICATION</u></b> The fire apparatus manufacturer shall provide a certification stating the power steering system as installed meets the requirements of the component supplier. The certification shall be provided at the time of bid.</p> <p><b><u>CAB INTEGRITY CERTIFICATION</u></b> The fire apparatus manufacturer shall provide a cab crash test certification with this proposal. The certification states that the cab must meet or exceed the requirements below:</p> <ul style="list-style-type: none"> <li>- European Occupant Protection Standard ECE Regulation No.29</li> <li>- SAE J2422 Cab Roof Strength Evaluation - Quasi-Static Loading Heavy Trucks</li> <li>- SAE J2420 COE Frontal Strength Evaluation - Dynamic Loading Heavy Trucks</li> <li>- Roof Crush</li> </ul> <p>The cab shall be subjected to a roof crush force of 100,000 lb. This value shall be 450 percent of the ECE 29 criteria, which must be equivalent to the front axle rating up to a maximum of ten (10) metric tons.</p> <ul style="list-style-type: none"> <li>- Side Impact</li> </ul> <p>The cab shall be subjected to dynamic preload with a 13,275-lb moving barrier is slammed into the side of the cab at 5.50 mph, striking with an impact of 13,000 ft-lb of energy. This test shall closely represent the forces a cab shall see in a rollover incident.</p> <ul style="list-style-type: none"> <li>- Frontal Impact</li> </ul> <p>The cab shall withstand a frontal force produced from 65,200 ft-lb of energy using a swing-bob type platen.</p> <p>The same cab shall withstand all tests without any measurable intrusion into the survival space of the occupant area.</p>		

## Cambridge Fire Department Apparatus Specification

Bidder  
Complies

Yes No

There shall be no exception to any portion of the cab integrity certification. Nonconformance shall lead to immediate rejection of bid.

### **CAB DOOR DURABILITY CERTIFICATION**

Robust cab doors help protect occupants. Cab doors shall survive a 200,000 cycle door slam test where the slamming force exceeds 20 G's of deceleration. The bidder shall certify that the sample doors similar to those provided on the apparatus have been tested and have met these criteria without structural damage, latch malfunction, or significant component wear.

### **WINDSHIELD WIPER DURABILITY CERTIFICATION**

Visibility during inclement weather is essential to safe apparatus performance. Windshield wipers shall survive a 3 million cycle durability test in accordance with section 6.2 of SAE J198 *Windshield Wiper Systems - Trucks, Buses and Multipurpose Vehicles*. The bidder shall certify that the wiper system design has been tested and that the wiper system has met these criteria.

### **ELECTRIC WINDOW DURABILITY CERTIFICATION**

Cab window roll-up systems can cause maintenance problems if not designed for long service life. The window regulator design shall complete 30,000 complete up-down cycles and still function normally when finished. The bidder shall certify that sample doors and windows similar to those provided on the apparatus have been tested and have met these criteria without malfunction or significant component wear.

### **SEAT BELT ANCHOR STRENGTH**

Seat belt attachment strength is regulated by Federal Motor Vehicle Safety Standards and should be validated through testing. Each seat belt anchor design shall withstand 3000 lb of pull on both the lap and shoulder belt in accordance with FMVSS 571.210 Seat Belt Assembly Anchorages. The bidder shall certify that each anchor design was pull tested to the required force and met the appropriate criteria.

### **SEAT MOUNTING STRENGTH**

Seat attachment strength is regulated by Federal Motor Vehicle Safety Standards and should be validated through testing. Each seat mounting design shall be tested to withstand 20 G's of force in accordance with FMVSS 571.207 Seating Systems. The bidder shall certify that each seat mount and cab structure design was pull tested to the required force and met the appropriate criteria.

### **CAB DEFROSTER CERTIFICATION**

Visibility during inclement weather is essential to safe apparatus performance. The defroster system shall clear the required windshield zones in accordance with SAE J381 Windshield Defrosting Systems Test Procedure and

Cambridge Fire Department Apparatus Specification	Bidder Complies	
	Yes	No
<p>Performance Requirements - Trucks, Buses, and Multipurpose Vehicles. The bidder shall certify that the defrost system design has been tested in a cold chamber and passes the SAE J381 criteria.</p> <p><b><u>CAB HEATER CERTIFICATION</u></b>            Good cab heat performance and regulation provides a more effective working environment for personnel, whether in-transit, or at a scene. The cab heaters shall warm the cab 77 F from a cold-soak, within 30 minutes when tested using the coolant supply methods found in SAE J381. The bidder shall certify that a substantially similar cab has been tested and has met these criteria.</p> <p><b><u>AMP DRAW REPORT</u></b>            The bidder shall provide, at the time of bid and delivery, an itemized print out of the expected amp draw of the entire vehicle's electrical system.</p> <p>The manufacturer of the apparatus shall provide the following:</p> <ol style="list-style-type: none"> <li>1) Documentation of the electrical system performance tests.</li> <li>2) A written load analysis, which shall include the following:               <ol style="list-style-type: none"> <li>A) The nameplate rating of the alternator.</li> <li>B) The alternator rating under the conditions specified per: Applicable NFPA 1901 or 1906 (Current Edition).</li> <li>C) The minimum continuous load of each component that is specified per: Applicable NFPA 1901 or 1906 (Current Edition).</li> <li>D) Additional loads that, when added to the minimum continuous load, determine the total connected load.</li> <li>E) Each individual intermittent load.</li> </ol> </li> </ol> <p>All of the above listed items shall be provided by the bidder per the applicable NFPA 1901 or 1906 (Current Edition).</p>		

Cambridge Fire Department Apparatus Specification	Bidder Complies	
	Yes	No
<p><b><u>CHASSIS</u></b> Chassis provided shall be a new, tilt-type custom fire apparatus. The chassis shall be designed and manufactured for heavy-duty service, with adequate strength, capacity for the intended load to be sustained, and the type of service required. The chassis shall be the manufacturer's heavy-duty line tilt cab.</p> <p><b><u>MAXIMUM OVERALL HEIGHT</u></b> The maximum overall height of the apparatus shall be 11 feet 4 inches.</p> <p><b><u>MAXIMUM OVERALL LENGTH</u></b> The maximum overall length of the apparatus shall be 40 feet 2 inches.</p> <p><b><u>WHEELBASE</u></b> The wheelbase of the vehicle shall be no greater than 215.50 inches.</p> <p><b><u>GVW RATING</u></b> The gross vehicle weight rating shall be a minimum of 70,800 pounds.</p> <p><b><u>FRAME</u></b> The chassis frame shall be built with two (2) steel channels bolted to five (5) cross members or more, depending on other options of the apparatus. The side rails shall have a 13.38" tall web over the front and mid sections of the chassis, with a continuous smooth taper to 10.75" over the rear axle. Each rail shall have a section modulus of 25.992 cubic inches and a resisting bending moment (rbm) of 3,119,040 in-lb over the critical regions of the frame assembly, with a section modulus of 18.96 cubic inches with an rbm of 2,275,200 in-lb over the rear axle. The frame rails shall be constructed of 120,000 psi yield strength heat-treated .38" thick steel, with 3.50" wide flanges.</p> <p><b><u>FRAME REINFORCEMENT</u></b> In addition, a mainframe inverted "L" liner shall be provided. It shall be heat-treated steel measuring 12.00" x 3.00" x .25". Each liner shall have a section modulus of 7.795 cubic inches, yield strength of 110,000 psi, and rbm of 857,462 in-lb. Total rbm at wheelbase center shall be 3,976,502 pounds per rail.  The frame liner shall be mounted inside of the chassis frame rail and extend the full length of the frame.</p> <p><b><u>FRONT NON DRIVE AXLE</u></b> The front axle shall be of the independent suspension design with a ground rating of 22,800 lb.  Upper and lower control arms shall be used on each side of the axle. Upper control arm castings shall be made of 100,000-psi yield strength 8630 steel and the lower control arm casting shall be made of 55,000-psi yield ductile iron.</p>		

# Cambridge Fire Department Apparatus Specification

Bidder  
Complies

Yes No

The center cross members and side plates shall be constructed out of 80,000-psi yield strength steel.

Each control arm shall be mounted to the center section using elastomer bushings. These rubber bushings shall rotate on low friction plain bearings and be lubricated for life. Each bushing shall also have a flange end to absorb longitudinal impact loads, reducing noise and vibrations.

There shall be nine (9) grease fittings supplied, one (1) on each control arm pivot and one (1) on the steering gear extension.

The upper control arm shall be shorter than the lower arm so that wheel end geometry provides positive camber when deflected below rated load and negative camber above rated load.

Camber at load shall be zero degrees for optimum tire life.

The ball joint bearing shall be of low friction design and be maintenance free.

Toe links that are adjustable for alignment of the wheel to the center of the chassis shall be provided.

The wheel ends must have little to no bump steer when the chassis encounters a hole or obstacle.

The steering linkage shall provide proper steering angles for the inside and outside wheel, based on the vehicle wheelbase.

The axle shall have a third party certified turning angle of 45 degrees. Front discharge, front suction, or aluminum wheels shall not infringe on this cramp angle.

## FRONT SUSPENSION

Front independent suspension shall be provided with a minimum ground rating of 22,800 lb.

The independent suspension system shall be designed to provide maximum ride comfort. The design shall allow the vehicle to travel at highway speeds over improved road surfaces and at moderate speeds over rough terrain with minimal transfer of road shock and vibration to the vehicle's crew compartment.

Each wheel shall have torsion bar type spring. In addition, each front wheel end shall also have energy absorbing jounce bumpers to prevent bottoming of the suspension.

The suspension design shall be such that there is at least 10.00" of total wheel travel and a minimum of 3.75" before suspension bottoms.

The torsion bar anchor lock system allows for simple lean adjustments, without the use of shims. One can adjust for a lean within 15 minutes per side. Anchor adjustment design is such that it allows for ride height adjustment on each side.

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Bidder  
Complies

Yes No

The independent suspension shall be put through a durability test that has simulated a minimum of 140,000 miles of inner city driving.

## **SHOCK ABSORBERS**

Heavy-duty telescoping shock absorbers (KONI) shall be provided on the front suspension.

## **OIL SEALS**

Oil seals with viewing window shall be provided on the front axle.

## **FRONT TIRES**

Front tires shall be Goodyear 425/65R22.50 radials, 20 ply G296 tread, rated for 22,800 lb maximum axle load and 68 mph maximum speed.

The tires shall be mounted on 22.50" x 12.25" steel disc-type wheels with a ten (10)-stud, 11.25" bolt circle.

## **TURNING RADIUS REPORT**

Supplied with the bid shall be a turning radius analysis of the vehicle being proposed. This analysis shall provide the inside turning radius, the outside turning radius, the curb to curb turning radius, and the wall to wall turning radius.

## **REAR AXLE**

The rear axle shall be a Meritor™, Model RT-46-160, tandem axle assembly with a capacity of 48,000 lb.

An inter-axle differential, which divides torque evenly between axles, shall be provided with an indicator light mounted on the cab instrument panel.

## **TOP SPEED OF VEHICLE**

A rear axle ratio shall be furnished to allow the vehicle to reach a top speed of 60 MPH.

## **REAR SUSPENSION**

Rear suspension shall be a Ridewell Dynalastic Model 202S with a ground rating of 48,000 lb. The suspension shall have the following features:

- Individually articulating torque beams pivoted to a compensator providing independent axle movement and steady load distribution
- Utilizes Ultra Torque Rod Plus torque rods

## **OIL SEALS**

Oil seals shall be provided on the rear axle.

Cambridge Fire Department Apparatus Specification	Bidder Complies	
	Yes	No
<p><b><u>REAR TIRES</u></b> Rear tires shall be eight (8) Goodyear 12R22.50 radials, 16 ply all season G124 tread, rated for 54,240 lb maximum axle load and 75 mph maximum speed.</p> <p>The tires shall be mounted on 22.50" x 8.25" steel disc-type wheels with a ten (10)-stud 11.25" bolt circle.</p>		
<p><b><u>TIRE BALANCE</u></b> All tires shall be balanced with Counteract balancing beads. The beads shall be inserted into the tire and eliminate the need for wheel weights.</p>		
<p><b><u>TIRE PRESSURE MANAGEMENT</u></b> There shall be a VECSAFE LED tire alert pressure management system provided that shall monitor each tire's pressure. A chrome plated brass sensor shall be provided on the valve stem of each tire for a total of 10 tires.</p> <p>The sensor shall calibrate to the tire pressure when installed on the valve stem for pressures between 20 and 120 psi. The sensor shall activate an integral battery operated LED when the pressure of that tire drops eight (8) psi.</p> <p>Removing the cap from the sensor shall indicate the functionality of the sensor and battery. If the sensor and battery are in working condition, the LED shall immediately start blinking.</p>		
<p><b><u>HUB COVERS (front)</u></b> Stainless steel hub covers shall be provided on the front axle. An oil level viewing window shall be provided.</p>		
<p><b><u>HUB COVERS (rear)</u></b> Stainless steel baby moon covers shall be provided over the rear axle hubs.</p>		
<p><b><u>MUD FLAPS</u></b> Mud flaps shall be installed behind the front and rear wheels of the apparatus.</p>		
<p><b><u>MUD FLAPS</u></b> Mud flaps shall be installed ahead of the rear wheels on the apparatus.</p>		
<p><b><u>SPARE TIRE</u></b> A 425/65R22.50, 18 ply spare tire to match the vehicle's front tires shall be provided, mounted on a steel disc wheel. All wheel surfaces shall be provided with powder coat paint #106 red.</p>		
<p><b><u>SPARE TIRE</u></b> A spare tire, 12R22.5, 16 ply, to match the vehicle's rear tires shall be provided and mounted on a steel disc wheel. All wheel surfaces shall be provided with powder coat paint #106 red.</p>		

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Bidder  
Complies

Yes No

## WHEEL CHOCKS

There shall be two (2) pairs of folding Ziamatic SAC-44-E, aluminum alloy, Quick-Choc wheel blocks with easy-grip handle provided.

## WHEEL CHOCK BRACKETS

There shall be two (2) pairs of Ziamatic SQCH-44-H horizontal mounting wheel chock brackets provided for the Ziamatic SAC-44-E folding wheel chocks. The brackets shall be mounted one (1) set each side ahead of the rear wheels.

## ELECTRONIC STABILITY CONTROL

A vehicle control system shall be provided as an integral part of the ABS brake system from Meritor Wabco.

The system shall monitor and update the lateral acceleration of the vehicle and compare it to a critical threshold where a side roll event may occur. If the critical threshold is met, the vehicle control system shall automatically reduce engine RPM, engage the engine retarder (if equipped), and selectively apply brakes to the individual wheel ends of the front and rear axles to reduce the possibility of a side roll event.

The system shall monitor directional stability through a lateral accelerometer, steer angle sensor and yaw rate sensor. If spinout or drift out is detected, the vehicle control system shall selectively apply brakes to the individual wheel ends of the front and rear axles to bring the vehicle back to its intended direction.

## ANTI-LOCK BRAKE SYSTEM

The vehicle shall be equipped with a Wabco 6S6M, anti-lock braking system. The ABS shall provide a six (6) channel anti-lock braking control on both the front and rear wheels. A digitally controlled system that utilizes microprocessor technology shall control the anti-lock braking system. Each wheel shall be monitored by the system. When any wheel begins to lockup, a signal shall be sent to the control unit. This control unit shall then reduce the braking of that wheel for a fraction of a second and then reapply the brake. This anti-lock brake system shall eliminate the lockup of any wheel thus helping to prevent the apparatus from skidding out of control.

## AUTOMATIC TRACTION CONTROL

An anti-slip feature shall be included with the ABS. The Automatic Traction Control shall be used for traction in poor road and weather conditions. The Automatic Traction Control shall act as an electronic differential lock that shall not allow a driving wheel to spin, thereby supplying traction at all times. The ABS electronic control unit (ECU) shall work with the engine ECU, sharing information concerning wheel slip. Engine ECU shall use information to control engine speed, allowing only as much throttle application as required for the available traction, regardless of how much the driver is asking for. A

Cambridge Fire Department Apparatus Specification	Bidder Complies	
	Yes	No
<p>"mud/snow" switch shall be provided on the instrument panel. Activation of the switch shall allow additional tire slip to let the truck climb out and get on top of deep snow or mud.</p> <p><b><u>ELECTRONIC STABILITY CONTROL SYSTEM, ANTI-LOCK BRAKE SYSTEM &amp; AUTOMATIC TRACTION CONTROL WARRANTY</u></b></p> <p>The Wabco ABS/ATC system shall come with a <b>three (3) year or 300,000 mile parts and labor</b> warranty provided by Meritor Wabco Vehicle Control Systems.</p> <p><b><u>BRAKES</u></b></p> <p>The service brake system shall be full air type.</p> <p>The front brakes shall be Knorr/Bendix disc type with a 17.00" ventilated rotor for improved stopping distance.</p> <p>The brake system shall be certified, third party inspected, for improved stopping distance.</p> <p>The rear brakes shall be Meritor™ 16.50" x 7.00" cam operated with automatic slack adjusters.</p> <p><b><u>AIR COMPRESSOR, BRAKE SYSTEM</u></b></p> <p>The air compressor shall be a Bendix BA-921 with 15.80 cubic feet per minute output at 1,250 RPM.</p> <p><b><u>BRAKE SYSTEM</u></b></p> <p>The brake system shall include:</p> <ul style="list-style-type: none"> <li>- Bendix Westinghouse dual brake treadle valve with vinyl covered foot surface</li> <li>- Heated automatic moisture ejector on air dryer</li> <li>- Total air system capacity of 6,653 cubic inches</li> <li>- Two (2) air pressure gauges with a red warning light and an audible alarm, that activates when air pressure falls below 60 psi</li> <li>- MGM spring set parking brake system</li> <li>- Parking brake operated by a Bendix-Westinghouse PP-1 control valve</li> <li>- A parking "brake on" indicator light on instrument panel</li> <li>- Bendix-Westinghouse SR-1 valve, in conjunction with a double check valve system, shall be provided with an automatic spring brake application at 40 psi</li> </ul> <p>The air tank shall be primed and painted to meet a minimum 750 hour salt spray test.</p>		

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Complies

Yes No

To reduce the effects of corrosion, the air tank shall be mounted with stainless steel brackets. (No exception).

- Wabco System Saver 1200 air dryer with spin-on coalescing filter cartridge
- 100 Watt Heater

## BRAKE LINES

**Wire braided stainless steel reinforced rubber brake lines shall be provided for the chassis air brake system, up to the individual line coupler fittings, located in the chassis frame forward of the front axle.**

The coupler fittings shall be the separation point for all air lines going to the front of the chassis and into the cab.

The air lines going into the cab shall be nylon, wrapped in loom.

The area where the nylon air lines run shall be well protected inside the frame rails.

The brake lines shall not be painted.

## AIR INLET

One (1) air inlet with male coupling shall be provided. It shall allow station air to be supplied to the apparatus brake system through a shoreline hose. The inlet shall be located in the driver side lower step well of cab. A check valve shall be provided to prevent reverse flow of air. The inlet shall discharge into the "wet" tank of the brake system. A mating female coupling shall also be provided with the loose equipment.

## AIR OUTLET

One (1) air outlet shall be installed with a female coupling and shut off valve, located in the front body compartment P-4 on passenger side. This system shall tie into the "wet" tank of the brake system and include an 85-psi pressure protection valve in the outlet line to prevent the brake system from losing all air.

A mating male fitting shall be provided with the loose equipment.

## ALL WHEEL LOCK-UP

An additional all wheel lock-up system shall be installed which applies air to the front brakes only. The standard spring brake control valve system shall be used for the rear.

## COVER, OVER PARKING BRAKE KNOB

There shall be a stainless steel hinged cover provided over the 2nd parking brake on the right (officer's) side parking brake knob to prevent accidental activation of the brake.

The cover shall be labeled "Emergency Parking Brake".

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	Yes	No
<p><b><u>U-BOLT GUARD OVER PARKING BRAKE KNOB</u></b>  There shall be one (1) U-bolt type protective guard(s) installed over the "Parking Brake" knob to prevent accidental activation of the brake. The guard shall be located on the driver's side.</p> <p><b><u>PARK BRAKE CONTROL (additional)</u></b>  A second park brake control valve shall be installed on the officer side of the instrument panel. This valve shall only activate the brakes if manually pulled out; low air pressure shall not activate this valve.</p> <p><b><u>ENGINE</u></b>  The chassis shall be powered by an electronically controlled engine as described below:</p> <p>Make: Detroit Diesel</p> <p>Model: DD13</p> <p>Power: 450 hp at 1800 rpm</p> <p>Torque: 1550 lb-ft at 1200 rpm</p> <p>Governed Speed: 2080 rpm</p> <p>Emissions Level: EPA 2010</p> <p>Fuel: Diesel</p> <p>Cylinders: Six (6)</p> <p>Displacement: 781 cubic inches (12.8L)</p> <p>Starter: Delco 39MT</p> <p>Fuel Filters: Dual cartridge style with check valve, water separator, and water in fuel sensor</p> <p>Coolant Filter: Cartridge style with shut off valves on the supply and return line.</p> <p><b><u>HIGH IDLE</u></b>  A high idle switch shall be provided, inside the cab, on the instrument panel, that shall automatically maintain a preset engine rpm. A switch shall be installed, at the cab instrument panel, for activation/deactivation.</p> <p>The high idle shall be operational only when the parking brake is on and the truck transmission is in neutral. A green indicator light shall be provided, adjacent to the switch. The light shall illuminate when the above conditions are met. The light shall be labeled "OK to Engage High Idle."</p>		

# Cambridge Fire Department Apparatus Specification

Bidder  
Complies

Yes No

## ENGINE BRAKE

A Jacobs engine brake is to be installed with the controls located on the instrument panel within easy reach of the driver.

The driver shall be able to turn the engine brake system on/off and have a high, medium and low setting.

The engine brake shall be installed in such a manner that when the engine brake is slowing the vehicle the brake lights are activated.

The ABS system shall automatically disengage the auxiliary braking device when required.

## CLUTCH FAN

A Horton fan clutch shall be provided. The fan clutch shall be automatic when the pump transmission is in "Road" position, and fully engaged in "Pump" position.

## SECOND ENGINE SHUTDOWN CONTROL FOR OFFICER

A second emergency engine shutdown control shall be provided for the officer. A pneumatic push-to-activate control shall be located in the cab, within easy reach of the officer's seat. A protective guard shall be supplied to avoid unnecessary activation.

The officer shall not have to move from a normal seated position to activate the emergency shutdown.

## BY-PASS FUEL FILTER

A Detroit Diesel Fuel Pro-482 filtering system shall be provided. The fuel filtering system shall be remote mounted on the chassis.

The system shall have the following features:

- Self priming port
- Clear cover
- Single filter system
- Fuel heater
- Drain valve
- Aluminum cylinder (act as fuel cooler)

## ENGINE AIR INTAKE

The air intake with an ember separator shall be mounted high on the passenger side of the cab, to the front of the crew cab door. The ember separator is designed to prevent road dirt and recirculating hot air from entering the engine.

The ember separator shall be easily accessible through a hinged stainless steel grille, with one (1) flush quarter turn latch.

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	Yes	No
<p><b><u>EXHAUST SYSTEM</u></b></p> <p>The exhaust system shall include a diesel particulate filter (DPF) and a selective catalytic reduction (SCR) device to meet current EPA standards. The exhaust system shall be stainless steel from the turbo to the inlet of the SCR device and shall be 5.00" in diameter. An insulation wrap shall be provided on all exhaust pipe between the turbo and SCR to minimize the transfer of heat to the cab. The exhaust shall terminate horizontally ahead of the passenger side rear wheels. A tailpipe diffuser shall be provided to reduce the temperature of the exhaust as it exits. Heat deflector shields shall be provided to isolate chassis and body components from the heat of the tailpipe diffuser.</p> <p>The exhaust system shall be packaged special to accommodate a 30.00" wide compartment in place of pump on an aerial.</p> <p><b><u>EXHAUST MODIFICATION</u></b></p> <p>The exhaust pipe shall be brought out from under the body at a 90 degree angle from the truck. The tail pipe shall extend a minimum of 2.00" past the body, adaptable for the Plymovent system. The diameter of the pipe shall be 7.00". There shall be a clearance of 4.00" completely around the pipe once past the side of the body. A stop shall be provided on the tail pipe that shall prevent the nozzle from sliding too far on.</p> <p><b><u>RADIATOR</u></b></p> <p>The radiator and the complete cooling system shall meet or exceed NFPA and engine manufacturer cooling system standards.</p> <p>For maximum cooling performance, the radiator core shall be made of copper fins having a serpentine design, soldered to brass tubes. The tubes shall be welded to brass headers using the patented Beta-Weld process for increased strength, longer road life and solder-bloom corrosion protection. The radiator core shall have a minimum frontal area of 1396 square inches. Steel supply and return tanks shall be bolted to the core headers and steel side channels to complete the radiator assembly. The radiator shall be compatible with commercial antifreeze solutions.</p> <p>The radiator shall 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 shall be isolated from the chassis frame rails with rubber isolators.</p> <p>The radiator shall include an integral deaeration tank, with a remote-mounted overflow tank. For visual coolant level inspection, the radiator shall have a built-in sight glass. The radiator shall be equipped with a 15 psi pressure relief cap.</p> <p>A drain port shall 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.</p>		

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	Yes	No
<p>A heavy-duty fan shall draw in fresh, cool air through the radiator. Shields or baffles shall be provided to prevent recirculation of hot air to the inlet side of the radiator.</p>		
<p><b><u>COOLANT LINES</u></b>  <b>Silicone hoses</b> shall be used for all engine/heater coolant lines installed by the chassis manufacturer.</p> <p>Hose clamps shall be stainless steel constant torque type to prevent coolant leakage. They shall react to temperature changes in the cooling system and expand or contract accordingly while maintaining a constant clamping pressure on the hose.</p> <p><b><u>FUEL TANK</u></b>  A 65-gallon fuel tank shall be provided and mounted at the rear of the chassis. The tank shall be constructed of <b>unpainted stainless steel</b>. It shall be equipped with swash partitions and a vent.</p> <p>To reduce the effects of corrosion, the fuel tank shall be mounted with stainless steel straps. (No exception).</p> <p>A .75" drain plug shall be provided in a low point of the tank for drainage.</p> <p>A fill inlet shall be located on the left hand side of the body and be covered with a hinged, spring loaded, stainless steel door that is marked "Ultra Low Sulfur - Diesel Fuel Only".</p> <p>A .50" diameter vent shall be provided running from top of tank to just below fuel fill inlet.</p> <p>The tank shall meet all FHWA 393.67 requirements, including a fill capacity of 95 percent of tank volume.</p> <p>All fuel lines shall be of the wire braided type.</p>		
<p><b><u>DIESEL EXHAUST FLUID TANK</u></b>  A 4.5 gallon diesel exhaust fluid (DEF) tank shall be provided and mounted in the driver's side body forward of the rear axle. The tank shall be constructed of 16-gauge type 304- L stainless steel.</p> <p>A .50" drain plug shall be provided in a low point of the tank for drainage.</p> <p>A fill inlet shall be located on the driver's side of the body and be covered with a hinged, spring loaded, stainless steel door that is marked "Diesel Exhaust Fluid Only".</p> <p>The tank shall meet the engine manufacturers requirement for 10 percent expansion space in the event of tank freezing.</p> <p>The tank shall include an integrated heater unit that utilizes engine coolant to thaw the DEF in the event of freezing.</p>		

Cambridge Fire Department Apparatus Specification	Bidder Complies	
	Yes	No
<p><b><u>AUXILIARY FUEL PUMP</u></b>  An auxiliary electric fuel pump shall be added to the fuel line for priming the engine. A switch located on the cab instrument panel shall be provided to operate the pump.</p> <p><b><u>FUEL SHUTOFF</u></b>  A shutoff valve shall be installed in the fuel line, on both sides of the fuel filter.</p> <p><b><u>FUEL COOLER</u></b>  An air to fuel cooler shall be installed in the engine fuel return line.   The fuel filler cap shall have a retaining chain and holder provided on the fuel fill door.</p> <p><b><u>FUEL DOOR LABEL</u></b>  There shall be a label provided on the inside stainless steel fuel door, to read "Ultra Low Sulfur Diesel Fuel Only".</p> <p><b><u>TRANSMISSION</u></b>  An Allison Gen IV, model EVS 4000P, electronic, torque converting, automatic transmission shall be provided.   The transmission shall be equipped with prognostics to monitor oil life, filter life, and transmission health. A wrench icon on the shift selector's digital display shall indicate when service is due.   Two (2) PTO openings shall be located on left side and top of converter housing (positions 8 o'clock and 1 o'clock).   A transmission temperature gauge with red light and buzzer shall be installed on the cab instrument panel.</p> <p><b><u>TRANSMISSION SHIFTER</u></b>  A six (6)-speed push button shift module with the 4 + 2 "Mode" button shall be mounted to right of driver on console. Shift position indicator shall be indirectly lit for after dark operation.   The Allison shifter shall be a "double-digit" display model.   The transmission ratio shall be 1st - 3.51 to 1.00, 2nd - 1.91 to 1.00, 3rd - 1.43 to 1.00, 4th - 1.00 to 1.00, 5th - 0.75 to 1.00, 6th - 0.64 to 1.00, R - 4.80 to 1.00.</p> <p><b><u>TRANSMISSION COOLER</u></b>  A transmission oil cooler shall be provided that is integral to the radiator and located at the bottom of the radiator. The cooler shall use engine coolant to control the transmission oil temperature.</p>		

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	Yes	No
<p><b><u>SYNTHETIC FLUID ONLY TAG</u></b> A tag shall be located at the transmission fill point labeled "Synthetic Fluid Only".</p> <p><b><u>SHIFT MODE</u></b> The shifter shall have a "Mode" button which shall be programmed to indicate the transmission fluid level.</p> <p><b><u>TRANSMISSION FLUID</u></b> <b>The transmission shall be provided with TranSynd, or other Allison approved TES-295 heavy duty synthetic transmission fluid.</b></p> <p><b><u>DRIVELINE</u></b> Drivelines shall be a heavy-duty metal tube and be equipped with Spicer 1810 universal joints.  The shafts shall be dynamically balanced before installation.  A splined slip joint shall be provided in each driveshaft, slip joint shall be coated with Glidecoat or equivalent.</p> <p><b><u>STEERING</u></b> Dual Sheppard M110 steering gears, with integral heavy-duty power steering, shall be provided. For reduced system temperatures, the power steering shall incorporate an air to oil cooler and an Eaton model VN20F hydraulic pump with integral pressure and flow control. All power steering lines shall have wire braded lines with crimped fittings.  A tilt and telescopic steering column shall be provided to improve fit for a broader range of driver configurations.</p> <p><b><u>STEERING WHEEL</u></b> The steering wheel shall be 18.00" in diameter, have tilting and telescoping capabilities, and a four (4)-spoke design.</p> <p><b><u>LOGO AND CUSTOMER DESIGNATION ON DASH</u></b> The dash panel shall have an emblem containing the fire apparatus manufacturer's logo and customer name. The emblem shall have three (3) rows of text for the customer's department name. There shall be a maximum of eight (8) characters in the first row, 11 characters in the second row and 11 characters in the third row.  The first row of text shall be: Cambridge  The second row of text shall be: Fire  The third row of text shall be: Department</p>		

Cambridge Fire Department Apparatus Specification	Bidder Complies	
	Yes	No
<p><b><u>AUTOMATIC CHASSIS LUBRICATION</u></b></p> <p>A Vogel Automatic Lubrication System shall be provided. The lubrication shall be supplied while the vehicle ignition switch is active to allow a uniform application of grease to the locations listed. The electronic control unit that forms part of the system shall activate the pump after an adjustable interval time. The unit shall control and monitor pump operation and report any faults via an indicator light on the driver's dashboard of the cab.</p> <p>The lubrication system reservoir, which requires a 15.00" wide x 14.50" high x 6.25" deep mounting area, shall be located underneath the body at the rear of the apparatus near the high pressure hydraulic filter on the apparatus.</p> <ul style="list-style-type: none"> <li>- Independent suspension control Arm Pivot Points</li> <li>- Steering Miter Box</li> <li>- Cab Hinge Pins</li> <li>- Rear Axle Slack Adjusters</li> <li>- Rear Axle Brake Cam Screws</li> <li>- Rear Suspension Spring Pins</li> <li>- Rear Suspension Shackle Pins</li> <li>- Walking Beam Pins Tandem axle, if applicable</li> </ul> <p><b><u>BUMPER</u></b></p> <p>A one (1) piece bumper manufactured from .25" formed steel with a .38" bend radius shall be provided. The bumper shall be a minimum of 10.00" high with a 1.50" top and bottom flange, and shall extend 19.00" from the face of the cab. The bumper shall be 95.28" wide with 45 degree corners and side plates. The bumper shall be metal finished and painted job color.</p> <p>To provide adequate support strength, the bumper shall be mounted directly to the front of the C channel frame. The frame shall be a bolted modular extension frame constructed of 50,000 psi tensile steel.</p> <p><b><u>GRAVEL PAN</u></b></p> <p>A gravel pan, constructed of bright aluminum treadplate, shall be furnished between the bumper and the cab face. The pan shall be properly supported from the underside to prevent flexing and vibration.</p> <p><b><u>LIFT AND TOW MOUNTS</u></b></p> <p>Mounted to the frame extension shall be lift and tow mounts. The lift and tow mounts shall be designed and positioned to adapt to certain tow truck lift systems.</p> <p>The lift and tow mounts with eyes shall be painted the same color as the frame.</p>		

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Bidder  
Complies

Yes No

## TOW HOOKS

No tow hooks are to be provided. This truck shall be equipped with a lift and tow package with integral tow eyes.

## HOSE TRAY

A hose tray, constructed of aluminum, shall be placed in the center of the bumper extension.

The tray shall have a capacity of 100' of 1.75" double jacket cotton-polyester hose.

Black rubber grating shall be provided at the bottom of the tray. Drain holes are also provided.

## GRAVEL PAN

A gravel pan, constructed of bright aluminum treadplate, shall be furnished between the bumper and cab face.

The gravel pan shall be properly supported from the underside to prevent flexing and vibration of the aluminum treadplate.

## STAINLESS STEEL SCUFFPLATE

A polished stainless steel scuffplate shall be provided on the top edge of the painted bumper. The scuffplate shall be bent 90 degrees and protect the top corner.

## COVER, HOSE TRAY

A bright aluminum treadplate cover shall be provided over the one (1) hose tray.

The cover shall be attached with a stainless steel hinge and located above the center tool tray.

A D-ring latch shall secure the cover in the closed position and a pneumatic stay arm shall hold the cover in the open position.

## LICENSE PLATE BRACKET

A non-illuminated license plate bracket shall be mounted on the front under the headlights on the driver's side. The bracket shall be formed from bright stainless steel.

## SIGHT RODS

Two (2) Bores, model BG48-10, lighted sight rods shall be mounted to the outside corners of the front bumper extension. The rods shall be chrome plated. The lights shall be connected to the marker lights, plus to its respective side directional.

# Cambridge Fire Department Apparatus Specification

Bidder  
Complies

Yes No

## CAB

**The cab shall be designed specifically for the fire service.**

Construction of the cab shall consist of 5052-H32 .125" aluminum welded to extruded aluminum framing.

The cab shall be 96.00" wide with an interior width of 87.50".

The forward cab section shall have an overall height from the cab roof to the ground of approximately 103.00". The crew cab section shall have a 10.00" raised roof, with an overall cab height of approximately 113.00". The overall height listed shall be calculated based on a truck configuration with the lowest suspension weight ratings, the smallest diameter tires for the suspension, no water weight, no loose equipment weight, and no personnel weight. Larger tires, wheels, and suspension shall increase the overall height listed.

The cab roof shall be provided with a 58.00" wide notch that lowers the center section of the cab roof by 4.00". The deep notch shall continue from the front of the cab and extend full length to the rear of the cab. The deep notch shall accommodate a low mount aerial device, and provide lower overall vehicle height.

The floor to ceiling height inside the crew cab shall be 50.50" in the center above the forward facing seats and 69.25" in the outboard positions.

The crew cab floor shall measure 40.12" from rear wall to the back side of engine tunnel.

The engine tunnel, at the rearward highest point (knee level), shall measure 47.75" to the back wall.

The crew cab shall be of the totally enclosed design with access doors constructed in the same manner as the driver and passenger doors.

The cab shall be a full tilt cab style. The engine shall be easily accessible and capable of being removed with the cab tilted. The cab shall be capable of tilting 45 degrees and 90 degrees with crane assist.

The cab shall have a three (3)-point rubber mounting and shall be tilted by a hydraulic pump connected to two (2) cab lift cylinders. The cab shall then be locked down by a two (2)-point automatic locking mechanism that actuates after the cab has been lowered.

## INTERIOR CAB INSULATION

The cab shall include 1.50" insulation in the ceiling and side walls, and 2.00" insulation in the rear wall to maximize acoustic absorption and thermal insulation.

<b>Cambridge Fire Department Apparatus Specification</b>	<b>Bidder Complies</b>	
	<b>Yes</b>	<b>No</b>
<p><b><u>ENGINE TUNNEL</u></b>  Engine hood side walls shall be constructed of .50" aluminum. The top shall be constructed of .19" aluminum and shall be tapered at the top to allow for more driver and passenger elbow room.</p> <p>The engine hood shall be insulated for protection from heat and sound. The noise insulation keeps the dba level within the limits stated in the current NFPA series 1900 pamphlet.</p> <p><b><u>FENDER LINERS</u></b>  Full circular inner fender liners in the wheel wells shall be provided.</p> <p><b><u>WINDSHIELD</u></b>  A curved safety glass windshield shall be provided with over 2,754 square inches of clear viewing area. The cab windshield shall have bright trim inserts in the rubber molding holding the glass in place. Economical windshield replacement glass shall be readily available from local auto glass suppliers.</p> <p>All cab glass shall be tinted.</p> <p><b><u>SUNVISORS</u></b>  Two (2) smoked Lexan sunvisors, 8.75" x 31.00" long, shall be provided. The sunvisors shall be located above the windshield with one (1) mounted on each side of the cab.</p> <p><b><u>WINDSHIELD WIPERS</u></b>  Two (2) electric windshield wipers with washer shall be provided that meet FMVSS and SAE requirements.</p> <p>The washer reservoir shall be able to be filled without raising the cab.</p> <p>A glove box with a drop-down door shall be installed in the front dash panel in front of the officer's position.</p> <p><b><u>CAB REAR WALL EXTERIOR COVERING</u></b>  The exterior surface of the rear wall of the cab shall be overlaid with bright aluminum treadplate except for areas that are not typically visible when the cab is lowered.</p> <p><b><u>CAB LIFT</u></b>  A hydraulic cab lift system shall be provided consisting of an electric powered hydraulic pump, dual lift cylinders, and necessary hoses and valves.</p> <p>The hydraulic pump shall have a manual override for backup in the event of electrical failure.</p> <p>Lift controls shall be on a panel located on the pump panel or front area of the body in a convenient location.</p>		

Cambridge Fire Department Apparatus Specification	Bidder Complies	
	Yes	No
<p>In addition to the panel controls, a 15.00' remote control shall be provided for raising and lowering the cab. The remote control shall be stored in the cab. The receptacle for the remote control shall be located next to the master controls on the panel.</p> <p>Cab shall be locked down by a two (2)-point automatic spring-loaded hook mechanism that actuates after the cab has been lowered.</p> <p>The hydraulic cylinders shall be equipped with a velocity fuse that protects the cab from accidentally descending when the control is located in the tilt position.</p> <p>For increased safety, a redundant mechanical stay arm shall be provided that must be manually put in place on the driver side between the chassis and cab frame when cab is in the raised position. This device shall be manually stowed to its original position before the cab can be lowered.</p> <p><b><u>INTERLOCK, CAB LIFT TO PARKING BRAKE</u></b>  The cab lift system shall be interlocked to the parking brake. The cab tilt mechanism shall be active only when the parking brake is set and the ignition switch is in the on position, if the parking brake is released the cab tilt mechanism shall be disabled.</p> <p><b><u>SCUFFPLATE</u></b>  A polished stainless steel scuffplate shall be provided on the entire rear vertical surface of the engine tunnel.</p> <p><b><u>SCUFFPLATE, CAB INTERIOR BACK WALL</u></b>  A polished stainless steel scuffplate shall be provided on the interior rear wall of the apparatus cab. The wall shall be completely covered from floor level to half way up the wall. The scuffplate shall be firmly affixed yet easily removable.</p> <p><b><u>DOOR JAMB SCUFFPLATES</u></b>  All cab door jambs shall be furnished with a polished stainless steel scuffplate, mounted on the striker side of the jamb.</p> <p><b><u>MOLDING (On Sides of Cab)</u></b>  Chrome molding shall be provided on both sides of cab.</p> <p><b><u>MIRRORS</u></b>  A Moto Mirror-Plus polished mirror, 7.62" x 13.50" flat glass and a 6.62" x 6.25" convex glass shall be mounted on each side of the front cab doors. Driver and passenger side mirrors shall be heated and adjustable with remote control convenient to the driver.</p> <p><b><u>DOORS</u></b>  To enhance entry and egress to the cab, the forward cab doors shall be a minimum of 37.50" wide x 61.75" high. The crew cab doors shall be located</p>		

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	Yes	No
<p>on the sides of the cab and shall be constructed in the same manner as the forward cab doors. The crew cab doors shall measure a minimum of 34.88" wide x 71.75" high.</p> <p>The forward cab and crew cab doors shall be constructed of extruded aluminum with a nominal material thickness of .125". The exterior door skins shall be constructed from .090" aluminum.</p> <p>All cab and crew cab entry doors shall contain a conventional roll down window.</p> <p>A flush mounted, chrome plated paddle type door handle shall be provided on the exterior of each cab door. Each door shall also be provided with an interior flush paddle handle.</p> <p>The cab doors shall be provided with both interior (rotary knob) and exterior (keyed) locks as required by FMVSS 206. The locks shall be capable of activating when the doors are open or closed. The doors shall remain locked if locks are activated when the doors are opened, then closed.</p> <p>A full length, heavy duty, stainless steel, piano-type hinge with a .38" pin and 11-gauge leaf shall be provided on all cab doors. There shall be double automotive-type rubber seals around the perimeter of the door framing and door edges to ensure a weather-tight fit.</p> <p>Full height polished stainless steel scuffplates shall be installed on the inside of all cab doors. Cab door panels shall be removable without disconnecting door and window mechanisms.</p> <p>A chrome handrail shall be provided on the inside each front cab door, for ease of entry.</p> <p>The cab steps at each door location shall be located below the cab doors and shall be exposed to the exterior of the cab.</p> <p><b><u>ELECTRIC OPERATED CAB DOOR WINDOWS</u></b></p> <p>All four (4) cab doors shall be equipped with electric operated windows with flush mounted automotive style switches.</p> <p>The driver's side lower instrument panel shall also have four (4) controls, one (1) for each door window.</p> <p><b><u>CAB STEPS</u></b></p> <p>The forward cab and crew cab access steps shall be a full size two (2) step design to provide largest possible stepping surfaces for safe ingress and egress. The bottom steps shall be designed with a grip pattern punched into bright aluminum treadplate material to provide support, slip resistance, and drainage. The bottom steps shall be a bolt-in design to minimize repair costs should they need to be replaced. The forward cab steps shall be a minimum 24.75" wide, and the crew cab steps shall be 21.25" wide with an 8.00" minimum depth. The inside cab steps shall not exceed 18.00" in height and be</p>		

Cambridge Fire Department Apparatus Specification	-- Bidder Complies	
	Yes	No
<p>limited to two (2) steps. Three (3) step entrance designs shall not be acceptable due to safety concerns. A slip-resistant handrail shall be provided adjacent to each cab door opening to assist during cab ingress and egress.</p> <p><b><u>STEP LIGHTS</u></b></p> <p>For reduced overall maintenance costs compared to incandescent lighting, there shall be eight (8) white LED, step lights provided. The lights shall be installed at each cab and crew cab door, two (2) per step, in the driver side front doorstep, driver side crew cab doorstep, passenger side front doorstep and passenger side crew cab doorstep.</p> <p>In order to ensure exceptional illumination, each light shall provide a minimum of 25 foot-candles (fc) covering an entire 15" x 15" square placed ten (10) inches below the light and a minimum of 1.5 fc covering an entire 30" x 30" square at the same ten (10) inch distance below the light.</p> <p>The lights shall be activated when the adjacent door is opened.</p> <p><b><u>FENDER CROWNS</u></b></p> <p>Stainless steel fender crowns shall be installed at the cab wheel openings. The fender crowns shall have a radius outside corner that allows the fender crown to extend beyond the side wall of the front tires and also allow the crew cab doors to open fully.</p> <p><b><u>CREW CAB WINDOWS</u></b></p> <p>One (1) fixed window with tinted glass shall be provided on each side of the cab, to the rear of the front cab door. The windows shall be sized to enhance light penetration into the cab interior. The windows shall measure 17.50" wide x 21.00" high.</p> <p><b><u>CAB ROOF COVERING</u></b></p> <p>Horizontal cab roof surfaces, on each side of the aerial device, shall be covered with bright aluminum treadplate. Edges and fastening screws shall be properly caulked to prevent water from leaking under the aluminum treadplate. Front and side warning lights shall not be mounted on top of the treadplate. The treadplate shall extend and terminate next to the warning lights.</p> <p><b><u>CAB INTERIOR</u></b></p> <p>The wrap-around style high impact ABS plastic cab dash fascia shall be designed to provide unobstructed visibility to instrumentation. The dash layout shall provide the driver with a quick reference to gauges that allows more time to focus on the road. The center console shall include an easily removable cover for the defroster.</p> <p>The officer side dash and center console shall be a flat faced design to provide easy maintenance and shall be constructed out of painted aluminum.</p>		

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	Yes	No
<p>The engine tunnel shall be padded and covered with 46 ounce leather grain vinyl resistant to oil, grease and mildew. The upper door liners shall be constructed of an aluminum backing covered with padded upholstery.</p> <p>The headliner shall be installed in both forward and rear cab sections. Headliner material shall be vinyl. A sound barrier shall be part of its composition. Material shall be installed on aluminum sheet and securely fastened to interior cab ceiling.</p> <p>Forward portion of cab headliner shall provide easy access for servicing electrical wiring or for other maintenance needs without removing the entire unit.</p> <p><b><u>CAB INTERIOR UPHOLSTERY</u></b> The cab interior upholstery shall be black.</p> <p><b><u>INTERIOR PAINT (Cab)</u></b> The cab interior metal surfaces shall be painted black, vinyl texture paint.</p> <p><b><u>CAB FLOOR</u></b> The cab and crew cab flooring shall be constructed with bright aluminum treadplate.</p> <p><b><u>CAB DEFROSTER</u></b> There shall be a 41,000 BTU/hr defroster in the cab located under the engine tunnel.</p> <p>The defroster ventilation shall be built into the design of the cab dash instrument panel and shall be easily removable for maintenance.</p> <p>The defroster shall have a three (3)-speed blower and temperature controls accessible to the driver and officer.</p> <p>The defroster ducts shall be designed to provide maximum defrosting capabilities for the front cab windows.</p> <p><b><u>CAB/CREW CAB HEATER</u></b> Two (2) auxiliary heaters with 32,000 BTU/hr each shall be provided in the cab. The heaters shall have a three (3)-speed blower and temperature controls accessible to the driver and officer. There shall also be louvers located below the rear facing seat riser and below the driver and officer positions for airflow.</p> <p>The heaters shall be mounted, one (1) within each rear facing seat riser.</p> <p><b><u>WINDOW DEFROST FANS</u></b> Two (2) window defrost fans shall be mounted on the ceiling of the cab, one (1) on each side of the cab.</p>		

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	Yes	No
<p><b><u>WINDOW DEFROST FANS</u></b>            There shall be two (2) 12 volt DC fans mounted on the ceiling of the crew cab, located one (1) each side in each corner of the rear crew cab.</p> <p><b><u>GRAB HANDLE</u></b>            A black rubber covered grab handle shall be mounted on the lower portion of the driver's side cab entrance to assist in entering the cab. The grab handle shall be securely mounted to the post area between the door and steering wheel column.</p> <p>A long rubber grab handle shall be mounted on the dash board in front of the officer.</p> <p><b><u>ENGINE COMPARTMENT LIGHT</u></b>            An engine compartment light shall be installed under the engine hood, of which the switch is an integral part. Light shall have a .125" diameter weep hole in its lens to prevent moisture retention.</p> <p><b><u>ACCESS TO ENGINE DIPSTICKS</u></b>            For access to the engine oil and transmission fluid dipsticks, there shall be a door on the engine tunnel, inside the crew cab. The door shall be on the rear wall of the engine tunnel, on the vertical surface. The door shall be 17.75" wide x 12.75" high and be flush with the wall of the engine tunnel.</p> <p>The engine oil dipstick shall allow for checking only. The transmission dipstick shall allow for both checking and filling. An additional tube shall be provided for filling the engine oil.</p> <p>The door shall have a rubber seal for thermal and acoustic insulation. One (1) flush latch shall be provided on the access door.</p> <p><b><u>MAP BOX</u></b>            There shall be one (1) map box with three (3) bins, open at top. The location required shall be shipped loose. The map box shall be divided into three (3) bins, each being 12.50" wide x 3.00" high x 12.00" deep. Each bin shall slant 30 degrees from horizontal. The map box shall be constructed of .125" aluminum and shall be painted to match the cab interior.</p> <p><b><u>CAB SAFETY SYSTEM</u></b>            The cab shall be provided with a safety system designed to protect occupants in the event of a side roll or frontal impact, and shall include the following:</p> <ul style="list-style-type: none"> <li>• A supplemental restraint system (SRS) sensor shall be installed on a structural cab member behind the instrument panel. The SRS sensor shall perform real time diagnostics of all critical subsystems and shall record sensory inputs immediately before and during a side roll or frontal impact event.</li> </ul>		

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Bidder  
Complies

Yes No

- A slave SRS sensor shall be installed in the ceiling of the cab to provide capacity for eight (8) crew cab seating positions.
- A fault-indicating light shall be provided on the vehicle's instrument panel allowing the driver to monitor the operational status of the SRS system.
- A driver side front air bag shall be mounted in the steering wheel and shall be designed to protect the head and upper torso of the occupant, when used in combination with the three (3)-point seat belt.
- A passenger side knee bolster air bag shall be mounted in the modesty panel below the dash panel and shall be designed to protect the legs of the occupant, when used in combination with the three (3)-point seat belt.
- Air curtains shall be provided in the outboard bolster of outboard seat backs to provide a cushion between occupant and the cab wall.
- Suspension seats shall be provided with devices to retract them to the lowest travel position during a side roll or frontal impact event.
- Seat belts shall be provided with pre-tensioners to remove slack from the seat belt during a side roll or frontal impact event.

## **FRONTAL IMPACT PROTECTION**

The SRS system shall provide protection during a frontal or oblique impact event. The system shall activate when the vehicle decelerates at a predetermined G force known to cause injury to the occupants. The cab and chassis shall have been subjected, via third party test facility, to a crash impact during frontal and oblique impact testing. Testing included all major chassis and cab components such as mounting straps for fuel and air tanks, suspension mounts, front suspension components, rear suspensions components, frame rail cross members, engine and transmission and their mounts, pump house and mounts, frame extensions and body mounts. The testing provided configuration specific information used to optimize the timing for firing the safety restraint system. The sensor shall activate the pyrotechnic devices when the correct crash algorithm, wave form, is detected. (No exception).

The SRS system shall deploy the following components in the event of a frontal or oblique impact event:

- Driver side front air bag.
- Passenger side knee bolster air bag.
- Air curtains mounted in the outboard bolster of outboard seat backs.
- Suspension seats shall be retracted to the lowest travel position.
- Seat belts shall be pre-tensioned to firmly hold the occupant in place.

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	Yes	No
<p><b><u>SIDE ROLL PROTECTION</u></b></p> <p>The SRS system shall provide protection during a fast or slow 90-degree roll to the side, in which the vehicle comes to rest on its side. The system shall analyze the vehicle's angle and rate of roll to determine the optimal activation of the advanced occupant restraints.</p> <p>The SRS system shall deploy the following components in the event of a side roll:</p> <ul style="list-style-type: none"> <li>• Air curtains mounted in the outboard bolster of outboard seat backs.</li> <li>• Suspension seats shall be retracted to the lowest travel position.</li> <li>• Seat belts shall be pre-tensioned to firmly hold the occupant in place.</li> </ul> <p><b><u>SEATING CAPACITY</u></b></p> <p>The seating capacity in the cab shall be five (5).</p> <p><b><u>DRIVER SEAT</u></b></p> <p>A seat shall be provided in the cab for the driver. The seat design shall be a cam action type, with air suspension. For increased convenience, the seat shall include a manual control to adjust the horizontal position (6.00" travel). The manual horizontal control shall be a towel-bar style located below the forward part of the seat cushion. To provide flexibility for multiple driver configurations, the seat shall have an adjustable reclining back. The seat back shall be a high back style with side bolster pads for maximum support. For optimal comfort, the seat shall be provided with 17.00" deep foam cushions designed with EVC (elastomeric vibration control).</p> <p>The seat shall include the following features incorporated into the side roll protection system.</p> <p>Side air curtain shall be mounted integral to the outboard bolster of the seat back. The air curtain shall be covered by a decorative panel when in the stowed position.</p> <p>A suspension seat safety system shall be included. When activated in the event of a side roll, this system shall pretension the seat belt, then retract the seat to its lowest travel position.</p> <p>The seat shall be furnished with a three (3)-point, shoulder type seat belt. The seat belt tongue shall be stored at waist position for quick application by the seat occupant. The seat belt receptacle shall be provided on a cable conveniently nested next to the seat cushion, providing easy accessibility. The seat belt shall be furnished with dual automatic retractors that shall provide ease of operation in the normal seating position.</p> <p><b><u>OFFICER SEAT</u></b></p> <p>A seat shall be provided in the cab for the passenger. The seat shall be a fixed type, with no suspension. The seat back shall be a high-back style with nine (9)</p>		

Cambridge Fire Department Apparatus Specification	Bidder Complies	
	Yes	No
<p>degree fixed recline angle and side bolster pads for maximum support. For optimal comfort, the seat shall be provided with 17.00" deep foam cushions designed with EVC (elastomeric vibration control). To ensure safe operation, the seat shall be equipped with seat belt sensors in the seat cushion and belt receptacle that shall activate an alarm indicating a seat is occupied but not buckled.</p> <p>The seat shall include the following features incorporated into the side roll protection system.</p> <p style="padding-left: 40px;">Side air curtain shall be mounted integral to the outboard bolster of the seat back. The air curtain shall be covered by a decorative panel when in the stowed position.</p> <p style="padding-left: 40px;">A seat safety system shall be included. When activated, this system shall pretension the seat belt.</p> <p>The seat shall be furnished with a three (3)-point, shoulder type seat belt. The seat belt tongue shall be stored at waist position for quick application by the seat occupant. The seat belt receptacle shall be provided on a cable conveniently nested next to the seat cushion, providing easy accessibility. The seat belt shall be furnished with dual automatic retractors that shall provide ease of operation in the normal seating position.</p> <p><b><u>RADIO COMPARTMENT</u></b>  A radio compartment shall be provided under the officer's seat.</p> <p>The inside compartment dimensions shall be 14.50" deep x 14.50" across x 6.50" high.</p> <p>A drop-down door with a chrome plated lift and turn latch shall be provided for access.</p> <p>The compartment shall be constructed of smooth aluminum and painted to match the cab interior.</p> <p><b><u>EMS COMPARTMENT</u></b>  A rear facing EMS compartment shall be provided in the crew cab at the driver side outboard position.</p> <p>The compartment shall be 22.00" wide x 42.50" high x 26.00" deep with one (1) Gortite roll up door, locking, with white finish. The clear door opening of the compartment shall be 32.50" high x 15.00" wide.</p> <p>The compartment shall be constructed of smooth aluminum and painted to match the cab interior.</p> <p><b><u>COMPARTMENT LIGHT</u></b>  There shall be one (1) On Scene Solutions LED strip light installed on the left side of the compartment opening. The lights shall be controlled by an automatic door switch.</p>		

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	Yes	No
<p>This storage compartment shall be compliant per NFPA standard for automotive fire apparatus.</p> <p><b><u>REAR FACING PASSENGER SIDE OUTBOARD SEAT</u></b></p> <p>There shall be one (1) rear facing seat provided at the passenger side outboard position in the crew cab. For optimal comfort, the seat shall be provided with 15.00" deep foam cushions designed with EVC (elastomeric vibration control). To ensure safe operation, the seat shall be equipped with seat belt sensors in the seat cushion and belt receptacle that shall activate an alarm indicating a seat is occupied but not buckled.</p> <p>The seat back shall be an SCBA back style with 5 degree fixed recline angle. The SCBA cavity shall be adjustable from front to rear in 1.00" increments, to accommodate different sized SCBA cylinders. Moving the SCBA cavity shall be accomplished by unbolting, relocating, and re-bolting it in the desired location.</p> <p>The seat shall include the following features incorporated into the side roll protection system.</p> <p style="padding-left: 40px;">Side air curtain shall be mounted integral to the outboard bolster of the seat back. The air curtain shall be covered by a decorative panel when in the stowed position.</p> <p style="padding-left: 40px;">A seat safety system shall be included. When activated this system shall pretension the seat belt around the occupant to firmly hold them in place in the event of a side roll.</p> <p>The seat shall be furnished with a three (3)-point, shoulder type seat belt. The seat belt tongue shall be stored at waist position for quick application by the seat occupant. The seat belt receptacle shall be provided on a cable conveniently nested next to the seat cushion, providing easy accessibility. The seat belt shall be furnished with dual automatic retractors that shall provide ease of operation in the normal seating position.</p> <p><b><u>FORWARD FACING CENTER SEATS</u></b></p> <p>There shall be two (2) forward facing seats provided at the center position in the crew cab. For optimal comfort, the seats shall be provided with 15.00" deep foam cushions designed with EVC (elastomeric vibration control). To ensure safe operation, the seats shall be equipped with seat belt sensors in the seat cushion and belt receptacle that shall activate an alarm indicating a seat is occupied but not buckled.</p> <p>The seat backs shall be an SCBA style with 90 degree back. The SCBA cavity shall be adjustable from front to rear in 1.00" increments to accommodate different sized SCBA cylinders. Moving the SCBA cavity shall be accomplished by unbolting, relocating, and re-bolting it in the desired location.</p> <p>The seats shall include the following feature incorporated into the side roll protection system.</p>		

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	Yes	No
<p>A seat safety system shall be included. When activated, this system shall pretension the seat belts around the occupants to firmly hold them in place in the event of a side roll.</p> <p>The seats shall be furnished with three (3)-point shoulder type seat belts. The seat belt tongue shall be stored at waist position for quick application by the seat occupant. The seat belt receptacle shall be provided on a cable conveniently nested next to the seat cushion, providing easy accessibility. The seat belts shall be furnished with dual automatic retractors that shall provide ease of operation in the normal seating position.</p> <p><b><u>EMS COMPARTMENT</u></b>  There shall be two (2) EMS compartments located at the driver's side outboard, forward facing seat position, one (1) above the other.</p> <p>The lower compartment shall be approximately 17.00" wide x 22.50" high x 14.00" deep, with an approximate clear door opening of 13.00" wide x 19.50" high.</p> <p>The compartment shall be constructed of aluminum and painted to match the cab interior.</p> <p>The upper compartment shall be approximately 12.00" wide x 14.50" high x 14.50" deep with an approximate clear door opening of 10.00" wide x 13.00" high.</p> <p>The compartment shall be constructed of aluminum and painted to match the cab interior.</p> <p>Each compartment shall have a painted door that is vertically hinged at the inside.</p> <p>The bottom of the compartment shall be approximately 29.00" above the floor to allow for a SCBA pack to be stored below.</p> <p><b><u>COMPARTMENT LIGHT</u></b>  One (1) compartment light shall be provided in each compartment. Light shall be controlled by an automatic door switch.</p> <p><b><u>EMS COMPARTMENT</u></b>  There shall be two (2) EMS compartments located at the passenger's side outboard, forward facing seat position, one (1) above the other.</p> <p>The lower compartment shall be approximately 17.00" wide x 22.50" high x 14.00" deep, with an approximate clear door opening of 13.00" wide x 19.50" high.</p> <p>The compartment shall be constructed of aluminum and painted to match the cab interior.</p>		

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	Yes	No
<p>The upper compartment shall be approximately 12.00" wide x 14.50" high x 14.50" deep with an approximate clear door opening of 10.00" wide x 13.00" wide.</p> <p>The compartment shall be constructed of aluminum and painted to match the cab interior.</p> <p>Each compartment shall have a painted door that is vertically hinged at the inside.</p> <p>The bottom of the compartment shall be approximately 29.00" above the floor to allow for a SCBA pack to be stored below.</p> <p><b>COMPARTMENT LIGHT</b> One (1) compartment light shall be provided in each compartment. Light shall be controlled by automatic door switch.</p> <p><b>SHELVING</b> There shall be one (1) shelf provided in the EMS compartment. Each shelf shall be constructed of .090" aluminum with a 1.25" up-turned lip. Shelving shall be infinitely adjustable by means of a threaded tightener sliding in a track.</p> <p>The location shall be centered with-in the EMS compartment.</p> <p><b>SEAT UPHOLSTERY</b> All seat upholstery shall be black Turnout Tuff material.</p> <p><b>AIR BOTTLE HOLDERS</b> All SCBA type seats in the cab shall have a "Hands-Free" auto clamp style bracket in its backrest. For efficiency and convenience, the bracket shall include an automatic spring clamp that allows the occupant to store the SCBA bottle by simply pushing it into the seat back. For protection of all occupants in the cab, in the event of an accident, the inertial components within the clamp shall constrain the SCBA bottle in the seat and shall exceed the NFPA standard of 9G. Bracket designs with manual restraints (belts, straps, buckles) that could be inadvertently left unlocked and allow the SCBA to move freely within the cab during an accident, shall not be acceptable.</p> <p>There shall be a quantity of three (3) SCBA brackets.</p> <p><b>AIR BOTTLE HOLDERS</b> Mounted on the back wall of the cab shall be Gen II Hands Free Brackets. For efficiency and convenience, the bracket shall include an automatic spring clamp that allows the user to store the SCBA bottle by simply pushing it into the bracket. For protection of all occupants in the cab, in the event of an accident, the inertial components within the clamp shall constrain the SCBA bottle for up to a 9G force (dynamic sled test), which meets NFPA standard. Bracket designs with manual restraints (belts, straps, buckles) that could be</p>		

Cambridge Fire Department Apparatus Specification	Bidder Complies													
	Yes	No												
<p>inadvertently left unlocked and allow the SCBA to move freely within the cab during an accident, shall not be acceptable.</p> <p>There shall be a quantity of two (2).</p> <p>The bracket shall be located one (1) each side in the crew cab corners on the rear wall approximately 3.0" upward from the compartment floor on the back wall.</p> <p><b><u>SHOULDER HARNESS HEIGHT ADJUSTMENT</u></b></p> <p>All seating positions furnished with three (3)-point shoulder type seat belts shall include a height adjustment. This adjustment shall optimize the belts effectiveness and comfort for the seated firefighter.</p> <p><b><u>SEAT BELTS</u></b></p> <p>All seating positions in the cab and crew cab shall have orange seat belts.</p> <p><b><u>SEAT BELT MONITORING ON COMMAND ZONE COLOR DISPLAY</u></b></p> <p>A seat belt monitoring screen shall be provided on the Command Zone color display. The system shall be capable of monitoring up to ten (10) seating positions in the cab with green and red seating icons illuminated as follows:</p> <table border="0" style="margin-left: 40px;"> <tr> <td>Seat Occupied</td> <td>Buckled</td> <td>Green Icon</td> </tr> <tr> <td>Seat Occupied</td> <td>Unbuckled</td> <td>Red Icon</td> </tr> <tr> <td>Seat Not Occupied</td> <td>Buckled</td> <td>Red Icon</td> </tr> <tr> <td>Seat Not Occupied</td> <td>Unbuckled</td> <td>No Icon</td> </tr> </table> <p>The seat belt monitoring screen shall become active on the Command Zone color display when:</p> <ul style="list-style-type: none"> <li>• The park brake is released:</li> <li>• and there is any occupant seated but not buckled or any belt buckled without an occupant:</li> <li>• and there are no other Do Not Move Truck conditions present. As soon as all Do Not Move Truck conditions are cleared, the seat belt monitoring screen shall be activated.</li> </ul> <p>The seat belt monitoring screen shall be manually selected anytime the Command Zone color display is powered.</p> <p>The seat belt monitoring screen shall be accompanied by an audible alarm that will activate when a red seat icon condition exists and the parking brake is released.</p>	Seat Occupied	Buckled	Green Icon	Seat Occupied	Unbuckled	Red Icon	Seat Not Occupied	Buckled	Red Icon	Seat Not Occupied	Unbuckled	No Icon		
Seat Occupied	Buckled	Green Icon												
Seat Occupied	Unbuckled	Red Icon												
Seat Not Occupied	Buckled	Red Icon												
Seat Not Occupied	Unbuckled	No Icon												

Cambridge Fire Department Apparatus Specification	Bidder Complies	
	Yes	No
<p><b><u>HELMET HOLDER</u></b>  There shall be five (5) Zico UHH-2 helmet holder bracket(s) provided in the cab. The brackets shall provide quick access and secure storage of the helmet(s). The bracket location(s) shall be determined at time of final inspection.</p>		
<p><b><u>CAB INTERIOR LIGHTING</u></b>  Auxiliary lights shall be provided in the cab and consisting of:</p> <ul style="list-style-type: none"> <li>- A Dome Light: Controlled by automatic door switches.</li> <li>- Two (2) Adjustable Map Lights: With switches mounted on the cab ceiling.</li> <li>- Two (2) dome lights with clear lenses shall be provided, one (1) each side in the cab above the driver and officer, controlled by automatic door switches.</li> <li>- Two (2) dome lights with red lenses shall be provided, one (1) each side in the cab above the driver and officer, controlled by switch on light only.</li> </ul>		
<p><b><u>CREW CAB INTERIOR LIGHTING</u></b>  There shall be four (4) Truck-Lite Model 3691W 4.00" 12 volt DC incandescent lights provided in the crew cab ceiling:</p> <ul style="list-style-type: none"> <li>• Two (2) recessed lights with clear lenses, one (1) each side of the crew cab for the rear facing seats, controlled by automatic door switches</li> <li>• Two (2) recessed dome lights with red lenses, one (1) each side of the crew cab for the forward facing seats, controlled by a switch near the light.</li> </ul>		
<p><b><u>CAB INSTRUMENTATION</u></b>  The cab instrument panel shall consist of gauges, an LCD display, telltale indicator lights, alarms, control switches, and a diagnostic panel. The function of instrument panel controls and switches shall be identified by a label adjacent to each item. Actuation of the headlight switch shall illuminate the labels in low light conditions. Telltale indicator lamps shall not be illuminated unless necessary. The cab instruments and controls shall be conveniently located within the forward cab section directly forward of the driver. Gauge and switch panels shall be designed to be removable for ease of service and low cost of ownership.</p>		
<p><b><u>GAUGES</u></b>  The gauge panel shall include the following ten (10) ivory gauges with chrome bezels to monitor vehicle performance:</p> <p>Voltmeter Gauge (Volts):</p> <p>Low volts (11.8 VDC)</p> <p>Amber indicator on gauge assembly with alarm</p>		

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Bidder  
Complies

Yes No

High volts (15 VDC)

Amber indicator on gauge assembly with alarm

Very low volts (11.3 VDC)

Amber indicator on gauge assembly with alarm

Very high volts (16 VDC)

Amber indicator on gauge assembly with alarm

Tachometer (RPM)

Speedometer (Primary (outside) MPH, Secondary (inside) Km/H)

Fuel Level Gauge (Empty - Full in fractions):

Low fuel (1/8 full)

Amber indicator on gauge assembly with alarm

Very low fuel (1/32) fuel

Amber indicator on gauge assembly with alarm

Engine Oil Pressure Gauge (PSI):

Low oil pressure to activate engine warning lights and alarms

Red indicator on gauge assembly with alarm

Front Air Pressure Gauge (PSI):

Low air pressure to activate warning lights and alarm

Red indicator on gauge assembly with alarm

Rear Air Pressure Gauge (PSI):

Low air pressure to activate warning lights and alarm.

Red indicator on gauge assembly with alarm

Transmission Oil Temperature Gauge (Fahrenheit):

High transmission oil temperature activates warning lights and alarm

Amber indicator on gauge assembly with alarm

Engine Coolant Temperature Gauge (Fahrenheit):

High engine temperature activates an engine warning light and alarm

Red indicator on gauge assembly with alarm

Diesel Exhaust Fluid Level Gauge (Empty - Full in fractions):

Low fluid (1/8 full)

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	Yes	No
<p>Amber indicator on gauge assembly with alarm</p> <p>All gauges and gauge indicators shall perform prove out at initial power-up to ensure proper performance.</p> <p><b><u>INDICATOR LAMPS</u></b></p> <p>To promote safety, the following telltale indicator lamps shall be integral to the gauge assembly and are located above and below the center gauges. The indicator lamps shall be "dead-front" design that is only visible when active. The colored indicator lights shall have descriptive text or symbols.</p> <p>The following amber telltale lamps shall be present:</p> <p>Low coolant</p> <p>Trac cntl (traction control) (where applicable)</p> <p>Check engine</p> <p>Check trans (check transmission)</p> <p>Aux brake overheat (Auxiliary brake overheat)</p> <p>Air rest (air restriction)</p> <p>Caution (triangle symbol)</p> <p>Water in fuel</p> <p>DPF (engine diesel particulate filter regeneration)</p> <p>Trailer ABS (where applicable)</p> <p>Wait to start (where applicable)</p> <p>HET (engine high exhaust temperature) (where applicable)</p> <p>ABS (antilock brake system)</p> <p>MIL (engine emissions system malfunction indicator lamp) (where applicable)</p> <p>SRS (supplemental restraint system) fault (where applicable)</p> <p>DEF (low diesel exhaust fluid level)</p> <p>The following red telltale lamps shall be present:</p> <p>Warning (stop sign symbol)</p> <p>Seat belt</p> <p>Parking brake</p> <p>Stop engine</p> <p>Rack down</p> <p>The following green telltale lamps shall be provided:</p>		

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Bidder  
Complies

Yes No

Left turn

Right turn

Battery on

The following blue telltale lamp shall be provided:

High beam

## ALARMS

**Audible steady tone warning alarm:** A steady audible tone alarm shall be provided whenever a warning message is present.

**Audible pulsing tone caution alarm:** A pulsing audible tone alarm (chime/chirp) shall be provided whenever a caution message is present without a warning message being present.

**Alarm silence:** Any active audible alarm shall be able to be silenced by holding the ignition switch at the top position for three (3) to five (5) seconds. For improved safety, silenced audible alarms shall intermittently chirp every 30 seconds until the alarm condition no longer exists. The intermittent chirp shall act as a reminder to the operator that a caution or warning condition still exists. Any new warning or caution condition shall enable the steady or pulsing tones respectively.

## INDICATOR LAMP AND ALARM PROVE-OUT

Telltale indicators and alarms shall perform prove-out at initial power-up to ensure proper performance.

## CONTROL SWITCHES

For ease of use, the following controls shall be provided immediately adjacent to the cab instrument panel within easy reach of the driver.

**Emergency master switch:** A molded plastic push button switch with integral indicator lamp shall be provided. Pressing the switch shall activate emergency response lights and siren control. A green lamp on the switch provides indication that the emergency master mode is active. Pressing the switch again disables the emergency master mode.

**Headlight / Parking light switch:** A three (3)-position maintained rocker switch shall be provided. The first switch position shall deactivate all parking lights and the headlights. The second switch position shall activate the parking lights. The third switch position shall activate the headlights.

**Panel backlighting intensity control switch:** A three (3)-position momentary rocker switch shall be provided. The first switch position decreases the panel backlighting intensity to a minimum level as the switch is held. The second switch position is the default position that does not affect the backlighting intensity. The third switch position increases the panel backlighting intensity to a maximum level as the switch is held.

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Bidder  
Complies

Yes	No
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The following standard controls shall be integral to the gauge assembly and are located below the right hand gauges. All switches have backlit labels for low light applications.

High idle engagement switch: A two (2)-position momentary rocker switch with integral indicator lamp shall be provided. The first switch position is the default switch position. The second switch position shall activate and deactivate the high idle function when pressed and released. The "Ok To Engage High Idle" indicator lamp must be active for the high idle function to engage. A green indicator lamp integral to the high idle engagement switch shall indicate when the high idle function is engaged.

"Ok To Engage High Idle" indicator lamp: A green indicator light shall be provided next to the high idle activation switch to indicate that the interlocks have been met to allow high idle engagement.

The following standard controls shall be provided adjacent to the cab gauge assembly within easy reach of the driver. All switches shall have backlit labels for low light applications.

Ignition switch: A three (3)-position maintained/momentary rocker switch shall be provided. The first switch position shall deactivate vehicle ignition. The second switch position shall activate vehicle ignition. The third momentary position shall disable the Command Zone audible alarm if held for three (3) to five (5) seconds. A green indicator lamp shall be activated with vehicle ignition.

Engine start switch: A two (2)-position momentary rocker switch shall be provided. The first switch position is the default switch position. The second switch position shall activate the vehicle's engine. The switch actuator is designed to prevent accidental activation.

4-way hazard switch: A two (2)-position maintained rocker switch shall be provided. The first switch position shall deactivate the 4-way hazard switch function. The second switch position shall activate the 4-way hazard function. The switch actuator shall be red and includes the international 4-way hazard symbol.

Heater and defroster controls.

Turn signal arm: A self-canceling turn signal with high beam headlight and windshield wiper/washer controls shall be provided. The windshield wiper control shall have high, low, and intermittent modes.

Parking brake control: An air actuated push/pull park brake control valve shall be provided.

Chassis horn control: Activation of the chassis horn control shall be provided through the center of the steering wheel.

<b>Cambridge Fire Department Apparatus Specification</b>	Bidder Complies	
	Yes	No
<p><b><u>CUSTOM SWITCH PANELS</u></b></p> <p>The design of cab instrumentation shall allow for emergency lighting and other switches to be placed within easy reach of the operator thus improving safety. There shall be positions for up to three (3) switch panels in the overhead console on the driver's side, up to four (4) switch panels in the engine tunnel console facing the driver, up to three (3) switch panels in the overhead console on the officer's side and up to three (3) switch panels in the engine tunnel rear facing console accessible to both driver and officer. All switches shall have backlit labels for low light applications.</p> <p><b><u>DIAGNOSTIC PANEL</u></b></p> <p>A diagnostic panel shall be accessible while standing on the ground and located inside the driver's side door left of the steering column. The diagnostic panel shall allow diagnostic tools such as computers to connect to various vehicle systems for improved troubleshooting providing a lower cost of ownership. Diagnostic switches shall allow engine and ABS systems to provide blink codes should a problem exist. The diagnostic panel shall include the following:</p> <p>Engine diagnostic port</p> <p>Transmission diagnostic port</p> <p>ABS diagnostic port</p> <p>SRS diagnostic port (where applicable)</p> <p>Command Zone USB diagnostic port</p> <p>Engine diagnostic switch (blink codes flashed on check engine telltale indicator)</p> <p>ABS diagnostic switch (blink codes flashed on ABS telltale indicator)</p> <p>Diesel particulate filter regeneration switch (where applicable)</p> <p>Diesel particulate filter regeneration inhibit switch (where applicable)</p> <p><b><u>CAB LCD DISPLAY</u></b></p> <p>A digital four (4)-row by 20-character dot matrix display shall be integral to the gauge panel. The display shall be capable of showing simple graphical images as well as text. The display shall be split into three (3) sections. Each section shall have a dedicated function. The upper left section shall display the outside ambient temperature. The upper right section shall display odometer, trip mileage, PTO hours, fuel consumption, engine hours, and other configuration specific information. The bottom section shall display INFO, CAUTION, and WARNING messages. Text messages shall automatically activate to describe the cause of an audible caution or warning alarm. The LCD shall be capable of displaying multiple text messages should more than one caution or warning condition exist.</p>		

Cambridge Fire Department Apparatus Specification	Bidder Complies	
	Yes	No
<p><b><u>AIR RESTRICTION INDICATOR</u></b>  A high air restriction warning indicator light LCD message with amber warning indicator and audible alarm shall be provided.</p> <p><b><u>SWITCH PANELS</u></b>  The emergency light switch panel shall have a master switch for ease of use plus individual switches for selective control. Each switch panel shall contain eight (8) membrane-type switches each rated for one million (1,000,000) cycles. Panels containing less than eight (8) switch assignments shall include non-functioning black appliques. Documentation shall be provided by the manufacturer indicating the rated cycle life of the switches. The switch panel(s) shall be located in the overhead position above the windshield on the driver side overhead to allow for easy access.</p> <p>The switches shall be membrane-type and also act as an integral indicator light. For quick, visual indication the entire surface of the switch shall be illuminated white whenever backlighting is activated and illuminated red whenever the switch is active. For ease of use, a two (2)-ply, scratch resistant laser engraved Gravoply label indicating the use of each switch shall be placed in the center of the switch. The label shall allow light to pass through the letters for ease of use in low light conditions.</p> <p><b><u>WIPER CONTROL</u></b>  For simple operation and easy reach, the windshield wiper control shall be an integral part of the directional light lever located on the steering column. The wiper control shall include high and low wiper speed settings, a one (1) speed intermittent wiper control with six (6) second interval and windshield washer switch. The control shall have a return to park provision, which allows the wipers to return to the stored position when the wipers are not in use.</p> <p>The wipers shall cease operation when the parking brake is set.</p> <p><b><u>HOURMETER - AERIAL DEVICE</u></b>  An hourmeter for the aerial device shall be provided and located within the cab display or instrument panel.</p> <p><b><u>AERIAL MASTER</u></b>  There shall be a master switch for the aerial operating electrical system provided.</p> <p><b><u>AERIAL PTO</u></b>  A PTO switch for the aerial with indicator light shall be provided.</p> <p><b><u>SPARE CIRCUIT</u></b>  There shall be two (2) pair of wires, including a positive and a negative, installed on the apparatus.</p> <p>The above wires shall have the following features:</p>		

# Cambridge Fire Department Apparatus Specification

Bidder  
Complies

Yes No

The positive wire shall be connected directly to the ignition switched power.

The negative wire shall be connected to ground.

Wires shall be protected to 15 amps at 12 volts DC.

Power and ground shall terminate on the right (officer's) side instrument panel.

Termination shall be with 15 amp, power point plug with rubber cover.

Wires shall be sized to 125% of the protection.

This circuit(s) may be load managed when the parking brake is set.

## SPARE CIRCUIT

There shall be one (1) pair of wires, including a positive and a negative, installed on the apparatus.

The above wires shall have the following features:

The positive wire shall be connected directly to the battery power.

The negative wire shall be connected to ground.

Wires shall be protected to 15 amps at 12 volts DC.

Power and ground shall terminate in the radio compartment towards the rear.

Termination shall be with 15 amp, power point plug with rubber cover.

Wires shall be sized to 125% of the protection.

This circuit(s) may be load managed when the parking brake is set.

## SPARE CIRCUIT

There shall be one (1) pair of wires, including a positive and a negative, installed on the apparatus.

The above wires shall have the following features:

The positive wire shall be connected directly to the ignition switched power.

The negative wire shall be connected to ground.

Wires shall be protected to 15 amps at 12 volts DC.

Power and ground shall terminate in the switch panel above the officer's seat.

Termination shall be with heat shrinkable butt splicing.

# Cambridge Fire Department Apparatus Specification

Bidder  
Complies

Yes No

Wires shall be sized to 125% of the protection.

This circuit(s) may be load managed when the parking brake is set.

## SPARE CIRCUIT 1<sup>st</sup>

There shall be two (2) pair of wires, including a positive and a negative, installed on the apparatus.

The above wires shall have the following features:

The positive wire shall be connected directly to the battery power.

The negative wire shall be connected to ground.

Wires shall be protected to 20 amps at 12 volts DC.

Power and ground shall terminate on the aluminum panel to the rear of the officer's seat.

Termination shall be with heat shrinkable butt splicing.

Wires shall be sized to 125% of the protection.

This circuit(s) may be load managed when the parking brake is set.

## SPARE CIRCUIT 2<sup>nd</sup>

There shall be one (1) pair of wires, including a positive and a negative, installed on the apparatus.

The above wires shall have the following features:

The positive wire shall be connected directly to the battery power.

The negative wire shall be connected to ground.

Wires shall be protected to 20 amps at 12 volts DC.

Power and ground shall terminate in the seat riser underneath the forward facing crew cab seats.

Termination shall be with heat shrinkable butt splicing.

Wires shall be sized to 125% of the protection.

This circuit(s) may be load managed when the parking brake is set.

## SPARE CIRCUIT 3<sup>rd</sup>

There shall be one (1) pair of wires, including a positive and a negative, installed on the apparatus.

The above wires shall have the following features:

The positive wire shall be connected directly to the ignition switched power.

Cambridge Fire Department Apparatus Specification	Bidder Complies	
	Yes	No
<p>The negative wire shall be connected to ground.</p> <p>Wires shall be protected to 20 amps at 12 volts DC.</p> <p>Power and ground shall terminate to the rear of the officer's seat riser.</p> <p>Termination shall be with heat shrinkable butt splicing.</p> <p>Wires shall be sized to 125% of the protection.</p> <p>This circuit(s) may be load managed when the parking brake is set.</p> <p><b><u>SPARE CIRCUIT</u></b></p> <p>There shall be two (2) pair of wires, including a positive and a negative, installed on the apparatus.</p> <p>The above wires shall have the following features:</p> <p>The positive wire shall be connected directly to the battery power.</p> <p>The negative wire shall be connected to ground.</p> <p>Wires shall be protected to 30 amps at 12 volts DC.</p> <p>Power and ground shall terminate one (1) in the EMS compartment on the rear wall towards the top, and one (1) near the HVAC controls.</p> <p>Termination shall be with six (6) position terminal strip.</p> <p>Wires shall be sized to 125% of the protection.</p> <p>This circuit(s) may be load managed when the parking brake is set.</p> <p><b><u>SHIELDED CABLE</u></b></p> <p>There shall be one (1) length of Triad Model 323321-1601 shielded cable with three (3) 16 gauge wires and PVC coating installed in the apparatus.</p> <p>This cable shall be routed from the instrument panel near the HVAC controls and extended to the rear of the officer's seat.</p> <p>These wires shall not be connected to any power source and shall not be connected to the vehicle electrical system.</p> <p><b><u>SHIELDED CABLE</u></b></p> <p>There shall be one (1) length of Triad Model 323321-1601 shielded cable with three (3) 16 gauge wires and PVC coating installed in the apparatus.</p> <p>This cable shall be routed from the instrument panel near the HVAC controls and extended to the rear of the officer's seat.</p> <p>These wires shall not be connected to any power source and shall not be connected to the vehicle electrical system.</p>		

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Bidder  
Complies

Yes No

## SPEAKER WIRE

The cab and crew cab shall be pre-wired with speaker wire for future installation of radio. Two (2) pair of speaker wires shall be routed from the officer's seat riser to the center of the cab towards the windshield.

## INFORMATION CENTER

An information center employing a 7.00" diagonal color LCD display shall be encased in an ABS plastic housing.

The information center shall have the following specifications:

- Operate in temperatures from -40 to 185 degrees F
- An Optical Gel shall be placed between the LCD and protective lens
- Five weather resistant user interface switches
- Black enclosure with gray decal
- Sunlight Readable
- Linux operating system
- Minimum of 400nits rated display
- Display can be changed to an available foreign language.

## OPERATION

The information center shall be designed for easy operation for everyday use.

The page button shall cycle from one screen to the next screen in a rotating fashion.

A video button shall allow a NTSC signal into the information center to be displayed on the LCD. Pressing any button while viewing a video feed shall return the information center to the vehicle information screens.

A menu button shall provide access to maintenance, setup and diagnostic screens.

All other button labels shall be specific to the information being viewed.

## GENERAL SCREEN DESIGN

Where possible, background colors shall be used to provide "At a Glance" vehicle information. If information provided on a screen is within acceptable limits, a green background shall be used. If a caution or warning situation arises the following shall occur:

- An amber background/text color shall indicate a caution condition.
- A red background/text color shall indicate a warning condition.

Every screen shall include the following:

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	Yes	No
<ul style="list-style-type: none"> <li>- Exterior Ambient Temperature</li> <li>- Time (12 or 24 hour mode)</li> <li>- Text Alert Center: <ul style="list-style-type: none"> <li>- The information center shall utilize an "Alert Center" to display text messages for audible alarm tones. The text messages shall be written to identify the item(s) causing the audible alarm to sound. If more than one (1) text message occurs, the messages shall cycle every second until the problem(s) have been resolved. The background color for the "Alert Center" shall change to indicate the severity of the "warning" message. If a warning and a caution condition occur simultaneously, the red background color shall be shown for all alert center messages.</li> <li>- Button Labels: A label for each button shall exist. The label shall indicate the function for each active button for each screen. Buttons that are not utilized on specific screens shall have a button label with no text.</li> </ul> </li> </ul> <p><b><u>PAGE SCREENS</u></b>  The Information center shall include the following screens:</p> <p>Load Manager Screen: A list of items to be load managed shall be provided. The list shall provide:</p> <ul style="list-style-type: none"> <li>- Description of the load</li> <li>- Individual load shed priority: The lower the priority number the earlier the device shall be shed should a low voltage condition occur.</li> <li>- Load Status: The screen shall indicate if a load has been shed (disabled) or not shed.</li> </ul> <p>"At a Glance" color features are utilized on this screen</p> <p>Do Not Move Truck: The Do Not Move Truck screen shall indicate the approximate location and type of item that is open or is not stowed for travel. The actual status of the following devices shall be indicated:</p> <ul style="list-style-type: none"> <li>- Driver Side Cab Door</li> <li>- Passenger's Side Cab Door</li> <li>- Driver Side Crew Cab Door</li> <li>- Passenger's Side Crew Cab Door</li> <li>- Driver Side Body Doors</li> <li>- Passenger's Side Body Doors</li> </ul>		

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Bidder  
Complies

Yes No

- Rear Body Door(s)
- Ladder Rack (if applicable)
- Deck Gun (if applicable)
- Light Tower (if applicable)
- Hatch Door (if applicable)
- Stabilizers (if applicable)
- Steps (if applicable)
- Any other device that is opened, extended, or deployed that creates a hazard or is likely to cause damage to the apparatus if the apparatus is moved, shall cause an "Alert Center" message if the parking brake is disengaged.

Chassis Information: The following information shall be shown:

- Engine RPM
- Fuel Level
- Battery Voltage
- Engine Coolant Temperature
- Engine Oil Pressure

"At a Glance" color features are utilized on this screen

Active Alarms List: This screen shall show a list of all active text messages. The list items text shall match the text messages shown in the "Alert Center". The date and time the message occurred is displayed with each message in the list.

## MENU SCREENS

The following screens shall be available through the Menu button:

View System Information: A detailed list of vehicle information:

- Battery Volts
- Pump Hours
- Transmission Oil Temperature
- Pump Engaged
- Engine Coolant Level
- Engine Oil Level
- Oil level shall only be shown when the engine is not running

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-- Bidder --  
Complies

Yes No

- Power Steering Level

Set daytime and nighttime Display Brightness:

- Brightness: Increase and decrease
- Default setting button

Configure Video Mode:

- Set Video Contrast
- Set Video Color
- Set Video Tint

Set Startup Screen:

- Choose the screen that shall be active at vehicle power-up

Set Date & Time:

- 12 or 24 hour format
- Set time
- Set date

View Active Alarms:

- Shows a list of all active alarms
  - Date and time of the occurrence is shown with each alarm
- Silence alarms
  - All alarms are silenced

System Diagnostics:

- Module type and ID number
- Module version
- Module diagnostics information:
  - Input or output number
  - Circuit number connected to that input or output
  - Circuit name (item connected to the circuit)
  - Status of the input or output
  - Power and Constant Current module diagnostic information

Button functions and button labels may change with each screen.

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Bidder  
Complies

Yes No

## VEHICLE DATA RECORDER

A vehicle data recorder (VDR) shall be provided. The VDR shall be capable of reading and storing vehicle information. The VDR shall be capable of operating in a voltage range from 8VDC to 16VDC. The VDR shall not interfere with, suspend, or delay any communications that may exist on the CAN data link during the power up, initialization, runtime, or power down sequence. The VDR shall continue operation upon termination of power or at voltages below 8VDC for a minimum of 10ms.

The information stored on the VDR can be downloaded through a USB port mounted in a convenient location determined by cab model. A CD provided with the apparatus shall include the programming to download the information from the VDR. A USB cable can be used to connect the VDR to a laptop to retrieve required information.

The vehicle data recorder shall be capable of recording the following data via hardwired and/or CAN inputs:

Vehicle Speed - MPH

Acceleration - MPH/sec

Deceleration - MPH/sec

Engine Speed - RPM

Engine Throttle Position - % of Full Throttle

ABS Event - On/Off

Seat Occupied Status - Yes/No by Position (7-12 Seating Capacity)

Seat Belt Buckled Status - Yes/No by Position (7-12 Seating Capacity)

Master Optical Warning Device Switch - On/Off

Time - 24 Hour Time

Date - Year/Month/Day

## RADIO ANTENNA MOUNT

There shall be four (4) standard antenna-mounting base(s), Model MATM, with 17 feet of coax cable and weatherproof cap provided for a two (2)-way radio installation. The standard mount shall be located on the cab roof, just to the rear of the officer seat and the additional mount(s) shall be located three (3) to the rear of the officer's seat and one (1) to the instrument panel near the HVAC controls. The cable(s) shall be routed two (2) on the left side and two (2) on the right side of the cab to the rear of the forward facing lightbar.

## ELECTRICAL POWER CONTROL SYSTEM

The primary power distribution shall be located forward of the officer's seating position and be easily accessible while standing on the ground for simplified maintenance and troubleshooting. Additional electrical distribution centers

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Bidder  
Complies

Yes

No

shall be provided throughout the vehicle to house the vehicle's electrical power, circuit protection, and control components. The electrical distribution centers shall be located strategically throughout the vehicle to minimize wire length. For ease of maintenance, all electrical distribution centers shall be easily accessible. All distribution centers containing fuses, circuit breakers and/or relays shall be easily accessible.

Distribution centers located throughout the vehicle shall contain battery powered studs for supplying customer installed equipment thus providing a lower cost of ownership.

Circuit protection devices, which conform to SAE standards, shall be utilized to protect electrical circuits. All circuit protection devices shall be rated per NFPA requirements to prevent wire and component damage when subjected to extreme current overload. General protection circuit breakers shall be Type-I automatic reset (continuously resetting). When required, automotive type fuses shall be utilized to protect electronic equipment. Control relays and solenoid shall have a direct current rating of 125 percent of the maximum current for which the circuit is protected per NFPA.

### SOLID-STATE CONTROL SYSTEM

A solid-state electronics based control system shall be utilized to achieve advanced operation and control of the vehicle components. A fully computerized vehicle network shall consist of electronic modules located near their point of use to reduce harness lengths and improve reliability. The control system shall comply with SAE J1939-11 recommended practices.

The control system shall operate as a master-slave system whereas the main control module instructs all other system components. The system shall contain patented Mission Critical software that maintains critical vehicle operations in the unlikely event of a main controller error. The system shall utilize a Real Time Operating System (RTOS) fully compliant with OSEK/VDX™ specifications providing a lower cost of ownership.

For increased reliability and simplified use the control system modules shall include the following attributes:

Green LED indicator light for module power

Red LED indicator light for network communication stability status

Control system self test at activation and continually throughout vehicle operation

No moving parts due to transistor logic

Software logic control for NFPA mandated safety interlocks and indicators

Integrated electrical system load management without additional components

Integrated electrical load sequencing system without additional components

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	Yes	No
<p>Customized control software to the vehicle's configuration</p> <p>Factory and field reprogrammable to accommodate changes to the vehicle's operating parameters</p> <p>Complete operating and troubleshooting manuals</p> <p>USB connection to the main control module for advanced troubleshooting</p> <p>To assure long life and operation in a broad range of environmental conditions, the solid-state control system modules shall meet the following specifications:</p> <p>Module circuit board shall meet SAE J771 specifications</p> <p>Operating temperature from -40C to +70C</p> <p>Storage temperature from -40C to +70C</p> <p>Vibration to 50g</p> <p>IP67 rated enclosure (Totally protected against dust and also protected against the effect of temporary immersion between 15 centimeters and one (1) meter)</p> <p>Operating voltage from eight (8) volts to 16 volts DC</p> <p>The main controller shall activate status indicators and audible alarms designed to provide warning of problems before they become critical.</p> <p><b><u>CIRCUIT PROTECTION AND CONTROL DIAGRAM</u></b></p> <p>Copies of all job-specific, computer network input and output (I/O) connections shall be provided with each chassis. The sheets shall indicate the function of each module connection point, circuit protection information (where applicable), wire numbers, wire colors and load management information.</p> <p><b><u>ON-BOARD ADVANCED/VISUAL ELECTRICAL SYSTEM</u></b></p> <p><b><u>DIAGNOSTICS</u></b></p> <p>The on-board information center shall include the following diagnostic information:</p> <p>Text description of active warning or caution alarms</p> <p>Simplified warning indicators</p> <p>Amber caution light with intermittent alarm</p> <p>Red warning light with steady tone alarm</p> <p>All control system modules, with the exception of the main control module, shall contain on-board visual diagnostic LEDs that assist in troubleshooting. The LEDs shall be enclosed within the sealed, transparent module housing near the face of the module. One LED for each input or output shall be provided and shall illuminate whenever the respective input or output is active. Color-coded labels within the modules shall encompass the LEDs for ease of identification. The LED indicator lights shall provide point of use</p>		

Cambridge Fire Department Apparatus Specification	Bidder Complies	
	Yes	No
<p>information for reduced troubleshooting time without the need for an additional computer.</p> <p><b><u>ADVANCED DIAGNOSTICS</u></b>  An advanced, Windows-based, diagnostic software program shall be provided for this control system. The software shall provide troubleshooting tools to service technicians equipped with an IBM compatible computer.</p> <p>The service and maintenance software shall be easy to understand and use and have the ability to view system input/output (I/O) information.</p> <p><b><u>INDICATOR LIGHT AND ALARM PROVE-OUT SYSTEM</u></b>  A system shall be provided which automatically tests basic indicator lights and alarms located on the cab instrument panel.</p> <p><b><u>VOLTAGE MONITOR SYSTEM</u></b>  A voltage monitoring system shall be provided to indicate the status of the battery system connected to the vehicle's electrical load. The system shall provide visual and audible warning when the system voltage is below or above optimum levels.</p> <p>The alarm shall activate if the system falls below 11.8 volts DC for more than two (2) minutes.</p> <p><b><u>DEDICATED RADIO EQUIPMENT CONNECTION POINTS</u></b>  There shall be three (3) studs provided in the primary power distribution center located in front of the officer for two-way radio equipment.</p> <p>The studs shall consist of the following:  12-volt 40-amp battery switched power  12-volt 60-amp ignition switched power  12-volt 60-amp direct battery power</p> <p>There shall also be a 12-volt 100-amp ground stud located in or adjacent to the power distribution center.</p> <p><b><u>ENHANCED SOFTWARE</u></b>  The solid-state control system shall include the following software enhancements:</p> <p>All perimeter lights and scene lights (where applicable) shall be deactivated when the parking brake is released.</p> <p>Cab and crew cab dome lights shall remain on for ten (10) seconds for improved visibility after the doors close. The dome lights shall dim after ten (10) seconds or immediately if the vehicle is put into gear.</p>		

Cambridge Fire Department Apparatus Specification	Bidder Complies	
	Yes	No
<p>Cab and crew cab perimeter lights shall remain on for ten (10) seconds for improved visibility after the doors close. The dome lights shall dim after ten (10) seconds or immediately if the vehicle is put into gear.</p> <p><b><u>EMI/RFI PROTECTION</u></b></p> <p>To prevent erroneous signals from crosstalk contamination and interference, the electrical system shall meet, at a minimum, SAE J551/2, thus reducing undesired electromagnetic and radio frequency emissions. An advanced electrical system shall be used to ensure radiated and conducted electromagnetic interference (EMI) or radio frequency interference (RFI) emissions are suppressed at their source.</p> <p>The apparatus shall have the ability to operate in the electromagnetic environment typically found in fire ground operations to ensure clean operations. The electrical system shall meet, without exceptions, electromagnetic susceptibility conforming to SAE J1113/25 Region 1, Class C EMR for 10KHz-1GHz to 100 Volts/Meter. The vehicle OEM, upon request, shall provide EMC testing reports from testing conducted on an entire apparatus and shall certify that the vehicle meets SAE J551/2 and SAE J1113/25 Region 1, Class C EMR for 10KHz-1GHz to 100 Volts/Meter requirements. Component and partial (incomplete) vehicle testing is not adequate as overall vehicle design can impact test results and thus is not acceptable by itself.</p> <p>EMI/RFI susceptibility shall be controlled by applying appropriate circuit designs and shielding. The electrical system shall be designed for full compatibility with low-level control signals and high-powered two-way radio communication systems. Harness and cable routing shall be given careful attention to minimize the potential for conducting and radiated EMI/RFI susceptibility.</p> <p><b><u>BATTERY SYSTEM</u></b></p> <p>Six (6) 12 volt, Deka Model 1131XMF batteries that include the following features shall be provided:</p> <ul style="list-style-type: none"> <li>- 1000 CCA (cold cranking amps)</li> <li>- 185 reserve capacity</li> <li>- High cycle</li> <li>- Maintenance free</li> <li>- Group 31</li> <li>- Rating of 6000 CCA at 0 degrees Fahrenheit</li> <li>- 1110 minutes of reserve capacity</li> <li>- Threaded posts</li> </ul>		

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	Yes	No
<p><b><u>BATTERY SYSTEM</u></b>  A single starting system shall be provided.</p> <p>An ignition switch and starter button shall be located on the instrument panel.</p> <p><b><u>MASTER BATTERY SWITCH</u></b>  A master battery switch, to activate the battery system, shall be provided inside the cab within easy reach of the driver.</p> <p>An indicator light shall be provided on the instrument panel to notify the driver of the status of the battery system.</p> <p><b><u>BATTERY COMPARTMENTS</u></b>  Batteries shall be stored in well-ventilated compartments that are located under the cab and bolted directly to the chassis frame. The battery compartments shall be constructed of 3/16" steel plate and be designed to accommodate a maximum of three (3) group 31 batteries in each compartment. The battery hold-downs shall be of a non-corrosive material. All bolts and nuts shall be stainless steel.</p> <p>Heavy-duty battery cables shall be used to provide maximum power to the electrical system. Cables shall be color-coded.</p> <p>Battery terminal connections shall be coated with anti-corrosion compound. Battery solenoid terminal connections shall be encapsulated with semi-permanent rubberized compound.</p> <p><b><u>JUMPER STUDS</u></b>  One (1) set of battery jumper studs with plastic color-coded covers shall be installed on the bottom of the driver's side battery box. This shall provide for easy jumper cable access.</p> <p><b><u>STAINLESS STEEL BATTERY TRAYS</u></b>  Stainless steel battery trays shall be provided for the batteries to sit in.</p> <p><b><u>BATTERY CHARGER/ AIR COMPRESSOR</u></b>  A Kussmaul Pump Plus 1200, model 091-9-1200 single output battery charger/air compressor system shall be provided. A display bar graph indicating the state of charge shall be included.</p> <p>The automatic charger shall maintain one (1) set of batteries with a maximum output current of 40 amps.</p> <p>The 12-volt air compressor shall be installed to maintain the air system pressure when the vehicle is not in use.</p> <p>The battery charger shall be wired to the AC shoreline inlet through an AC receptacle adjacent to this battery charger.</p> <p>Battery charger/compressor shall be in the seat riser.</p>		

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	Yes	No
<p>The battery charger indicator shall be located on the driver's seat riser.</p> <p><b><u>SHORELINE</u></b>  There shall be one (1) shoreline receptacle provided to operate the 120-volt circuits on the truck without the use of the generator.</p> <p>The shoreline receptacle (s) shall be provided with a NEMA 5-20, 120 volt, 20 amp, straight blade plug and gray cast cover.</p> <p>The shoreline shall be connected to the battery charger.</p> <p>A mating connector body shall also be supplied with the loose equipment.</p> <p>The shoreline receptacle shall be located in the driver side lower step well of cab.</p> <p><b><u>ALTERNATOR</u></b>  A C.E. Niehoff, model C680-1, alternator shall be provided. It shall have a rated output current of 430 amp as measured by SAE method J56. Also, it shall have a custom three (3)-set point voltage regulator, manufactured by C. E. Niehoff. The alternator shall be connected to the power and ground distribution system with heavy-duty cables sized to carry the full rated alternator output.</p> <p><b><u>ELECTRONIC LOAD MANAGER</u></b>  An electronic load management (ELM) system shall be provided that monitors the vehicles 12-volt electrical system, automatically reducing the electrical load in the event of a low voltage condition, and automatically restoring the shed electrical loads when a low voltage condition expires. This ensures the integrity of the electrical system.</p> <p>For improved reliability and ease of use, the load manager system shall be an integral part of the vehicle's solid state control system requiring no additional components to perform load management tasks. Load management systems which require additional components shall not be allowed.</p> <p>The system shall include the following features:</p> <ul style="list-style-type: none"> <li>System voltage monitoring.</li> <li>A shed load shall remain inactive for a minimum of five minutes to prevent the load from cycling on and off.</li> <li>Sixteen available electronic load shedding levels.</li> <li>Priority levels can be set for individual outputs.</li> <li>High Idle to not be controlled by the load manager.</li> </ul> <p style="padding-left: 40px;">If enabled:</p>		

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Bidder  
Complies

Yes	No
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"Load Man Hi-Idle On" shall display on the information center.

Hi-Idle shall not activate until 30 seconds after engine start up.

Individual switch "on" indicator to flash when the particular load has been shed.

The information center indicates system voltage.

The information center, where applicable, includes a "Load Manager" screen indicating the following:

Load managed items list, with priority levels and item condition.

Individual load managed item condition:

ON = not shed

SHED = shed

## SEQUENCER

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

For improved reliability and ease of use, the load sequencing system shall be an integral part of the vehicle's solid state control system requiring no additional components to perform load sequencing tasks. Load sequencing systems which require additional components shall not be allowed.

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

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

Sequencing of the following items shall also occur, in conjunction with the ignition switch, at half-second intervals:

Cab Heater and Air Conditioning

Crew Cab Heater (if applicable)

Crew Cab Air Conditioning (if applicable)

Exhaust Fans (if applicable)

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Complies

Yes	No
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Third Evaporator (if applicable)

**EXTERIOR LIGHTING**

Exterior lighting shall meet or exceed Federal Department of Transportation, Federal Motor Vehicle Safety Standards and National Fire Protection Association requirements in effect at time of proposal.

Front headlights shall be halogen, rectangular shape, one (1) pair mounted in each front trim housing.

The LED directional lights shall wrap-around on the outside corners of the trim housing. The headlight and LED directional lights shall be in the same assembly.

Five (5) LED clearance and marker lights shall be installed across the leading edge of the cab.

**BACK-UP ALARM**

A PRECO, Model 1040, solid-state electronic audible back-up alarm that actuates when the truck is shifted into reverse shall be provided. The device shall sound at 60 pulses per minute and automatically adjust its volume to maintain a minimum ten (10) dBA above surrounding environmental noise levels.

**MANUAL, FIRE APPARATUS PARTS**

Two (2) custom parts manuals for the complete fire apparatus shall be provided in hard copy with the completed unit.

One (1) compact disc (CD) shall also be provided that shall include all of the information from the above manual.

The manual shall contain the following:

- Job number
- Part numbers with full descriptions
- Table of contents
- Parts section sorted in functional groups reflecting a major system, component, or assembly
- Parts section sorted in Alphabetical order
- Instructions on how to locate parts

The manual shall be specifically written for the chassis and body model being purchased. It shall not be a generic manual for a multitude of different chassis and bodies.

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	Yes	No
<p><b><u>SERVICE PARTS INTERNET SITE</u></b>  The service parts information included in this manual is also available on the factory website. The website offers additional functions and features not contained in this manual, such as digital photographs and line drawings of select items. The website also features electronic search tools to assist in locating parts quickly.</p> <p><b><u>MANUALS, CHASSIS SERVICE</u></b>  Two (2) chassis service manuals containing parts and service information on major components shall be provided with the completed unit.</p> <p>One (1) compact disk (CD) shall also be provided that shall include all of the information from the above manual.</p> <p>The manuals shall contain the following sections:</p> <ul style="list-style-type: none"> <li>- Job number</li> <li>- Table of contents</li> <li>- Troubleshooting</li> <li>- Front Axle/Suspension</li> <li>- Brakes</li> <li>- Engine</li> <li>- Tires</li> <li>- Wheels</li> <li>- Cab</li> <li>- Electrical, DC</li> <li>- Air Systems</li> <li>- Plumbing</li> <li>- Appendix</li> </ul> <p>The manual shall be specifically written for the chassis model being purchased. It shall not be a generic manual for a multitude of different chassis and bodies.</p> <p><b><u>MANUALS, CHASSIS OPERATION</u></b>  Two (2) chassis operation manuals shall be provided.</p> <p>One (1) compact disk (CD) shall also be provided that shall include all of the information from the above manual.</p>		

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Bidder  
Complies

Yes

No

## DIAGRAM, AS BUILT AIR BRAKE SCHEMATIC

There shall be a detailed diagram of the air brake system provided upon delivery. The diagram shall include air lines and parts that shall be located within the system.

## ELECTRICAL WIRING DIAGRAMS

Two (2) electrical wiring diagrams, prepared for the model of chassis and body, shall be provided.

# Cambridge Fire Department Apparatus Specification

Bidder  
Complies

Yes No

## CARGO AREA

The cargo area shall be fabricated of corrosion resistant, low carbon austenitic, brushed and painted **304L stainless steel**. Due to superior corrosion resistance of 300 stainless grades, other grades of austenitic stainless steels, or any grade of ferritic or martensitic stainless, shall not be acceptable.

The sides shall not form any portion of the fender compartments.

The upper and rear edges of the side panels shall have a double break for rigidity.

The cargo area shall be located ahead of the ladder turntable.

Flooring of the cargo area shall be aluminum treadplate.

## TURNTABLE STEPS

Steps to access the turntable from the driver side and passenger side shall be provided just behind the compartmentation.

The steps shall be a swing-down design, with the stepping area made of Morton Tread-Grip® channel.

The step height for the bottom step (the distance from the top surface of the step to the ground) shall not exceed 24.00" with the step in its extended position.

No step height (the distance between the top surfaces of any two (2) adjacent steps) shall be greater than 14.00".

The stepwell shall be lined with bright aluminum treadplate to act as scuffplates.

The steps shall be connected to the "Do Not Move Truck" indicator.

A handrail shall be provided on each side of the access steps. The rear handrails shall be a two piece design. The top curved portion of the handrail shall be one piece and the lower portion adjacent to the steps shall be one piece. The two pieces shall separate where the stanchion is typically located at the top of the turntable steps. The rear handrails shall be secured at each end.

## STEP LIGHTS

There shall be three (3) white LED step lights provided for each set of aerial turntable access steps.

In order to ensure exceptional illumination, each light shall provide a minimum of 25 foot-candles (fc) covering an entire 15" x 15" square placed ten (10) inches below the light and a minimum of 1.5 fc covering an entire 30" x 30" square at the same ten (10) inch distance below the light.

The step lights shall be actuated by the aerial master switch in the cab.

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Bidder  
Complies

Yes No

## REAR WALL, SMOOTH ALUMINUM

The rear wall shall be smooth aluminum and divided into three sections.

## TOW EYES

Two (2) rear painted tow eyes shall be located at the rear of the apparatus and shall be mounted directly to the torque box. The inner and outer edges of the tow eyes shall be radiused.

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Bidder  
Complies  
Yes No

## COMPARTMENTATION

Compartmentation shall be fabricated of corrosion resistant, low carbon austenitic, brushed and painted **304L stainless steel**. Due to superior corrosion resistance of 300 stainless grades, other grades of austenitic stainless steels, or any grade of ferritic or martensitic stainless, shall not be acceptable.

The side compartments are an integral assembly with the rear fenders. Circular fender liners shall be provided to prevent rust pockets and for ease of maintenance. Due to the severe loading requirements of this aerial, a method of compartment body support suitable for the intended load shall be provided.

The backbone of the support system shall be the chassis frame rail, which is the strongest component of the chassis and is designed for sustaining maximum loads.

A support system shall be used which shall incorporate a floating substructure by using Neoprene Elastomer isolators to allow the body to remain rigid while the chassis goes through its natural flex. The isolators shall have a broad range of proven viability in vehicular applications, be of a failsafe design, and allow for all necessary movement in three (3) transitional and rotational modes. This shall result in a 500 lb equipment rating for each lower compartment of the body.

The compartmentation in front of the rear axle shall include a 3.00" steel support assemblies which are bolted to the chassis frame rails. A steel framework shall be mounted to the body above these support assemblies connected to the support assemblies with isolators. There shall be one (1) support assembly mounted to each chassis frame rail.

The compartmentation behind the rear axle shall include 3.00" steel support assemblies which are bolted to the chassis frame rails and extend underneath to the outside edge of the body. The support assembly shall be coated to isolate the dissimilar metals before it is bolted to the body. The framework shall be coated, to isolate dissimilar metals. There shall be one (1) support assembly mounted to each chassis frame rail.

Compartment flooring shall be of the sweep out design with the floor higher than the compartment doorframe. The compartment door openings are framed by flanging the edges in 1.75" and bending out again .75" to form an angle. Drip protection is provided over all door openings by means of bright aluminum extrusion or formed bright aluminum treadplate. Side compartment tops shall be covered with bright aluminum treadplate and shall have edges that are rolled over to the front, rear and outward sides. The covers are fabricated in one (1) piece and have the corners TIG welded. A bright aluminum treadplate cover shall be provided on the front wall of each side compartment. All screws and bolts which protrude into a compartment shall have acorn nuts at the ends to prevent injury.

The body design has been fully tested. Proven engineering and test techniques such as finite element analysis, model analysis, stress coating and strain

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	Yes	No
gauging have been performed with special attention given to fatigue life and structural integrity of the compartment body and substructure.		
<p><b><u>AGGRESSIVE WALKING SURFACE</u></b> All exterior surfaces designated as stepping, standing, and walking areas shall comply with the required average slip resistance of the current NFPA standards.</p> <p><b><u>LOUVERS</u></b> All body compartments shall have a minimum of one (1) set of louvers stamped into a wall to provide the proper airflow inside the compartment and to prevent water from dripping into the compartment. These louvers shall be formed into the metal and not added to the compartment as a separate plate.</p> <p><b><u>COMPARTMENT IN PLACE OF PUMP</u></b> A single lap door compartment shall be installed in place of the pump and pump panel.  The driver side shall be approximately 24.25" wide x 42.25" high x 24.50" deep with a door opening of approximately 22.50" wide x 38.13" high.  The passenger side shall be approximately 24.25" wide x 64.00" high x 24.50" deep in the lower area and transversed in the top portion. The door opening shall be approximately 22.50" wide x 60.50" high.  The transverse portion of the compartment shall vary depending on chassis and engine combination.  The floor of the compartment shall be raised to accommodate the 2010 exhaust SCR and after treatment components.</p> <p><b><u>DRIVERS SIDE COMPARTMENTATION</u></b> A double door compartment ahead of the rear wheels shall be approximately 41.75" wide x 29.75" high x 24.25" deep inside with a door opening of approximately 40.00" wide x 26.63" high.  The compartment above the front stabilizer shall be removed to allow for the storage of the side-stacked ladders.  The body side sheets shall be full depth to accommodate the side-stacked ladders.  A double door compartment behind the rear wheels shall be approximately 43.75" wide x 29.75" high x 21.25" deep inside with a door opening of approximately 42.00" wide x 26.63" high.  The side sheet shall be located approximately 24.00" in from the outer edge of the body.  A canopy type catwalk shall be provided on the left (driver's) side of the unit. The catwalk shall protect the ground ladders on each side from the elements and shall support a 500lb load. The catwalk shall extend full length of the</p>		

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	Yes	No
<p>ladder storage and shall be covered with aluminum treadplate. The catwalk on the DS compartment in place of pump shall be the same height as the catwalk on the rear body to allow for the storage of a Little Giant ladder below.</p>		
<p><b><u>STOKES STORAGE COMPARTMENT</u></b>  A compartment constructed of aluminum diamond plate shall be installed on the driver's side of the truck, rearward of a Little Giant ladder. The compartment shall incorporate the catwalk. The compartment dimensions shall be approximately 25.00 "deep x 16.00" high and as long as possible. The compartment shall hold a Ferno Model 71 Stokes basket and related equipment. It shall have an aluminum treadplate, lift up door and be hinged at the top with a single D-ring handle latch in the center. The door shall have stiffeners added to the inside. The compartment shall have a movable partition to provide separation. Pneumatic struts shall be provided to hold door in open position. The compartment shall be supported by body side structure.</p>		
<p><b><u>COMPARTMENTATION, PASSENGERS SIDE</u></b>  A full height double door compartment, ahead of the rear wheels, shall be 41.75" wide x 64.00" high x 24.25" deep with a door opening of 40.00" wide x 60.50" high.</p> <p>One (1) lift-up door compartment shall be provided above the fender compartments and over the rear axles. The compartment shall be 72.13" wide x 33.25" high x 24.25" deep inside with a door opening of 65.00" wide x 29.62" high.</p> <p>A compartment with a single pan stainless steel door shall be located above the front stabilizer. The compartment shall be 23.00" high x 18.00" wide x 24.25" deep with a door opening of 15.75" high x 12.00" wide.</p> <p>A full height double door compartment, behind the rear wheels, shall be 43.75" wide x 49.25" high x 21.25" deep inside with a door opening of 42.00" wide x 45.75" high.</p> <p>A compartment below the turntable with a lift-up door, shall be 39.38" wide x 18.38" high x 21.25" deep inside with a door opening of 35.00" wide x 14.88" high.</p>		
<p><b><u>TRANSVERSE COMPARTMENT OVER TORQUE BOX</u></b>  One (1) upper forward body compartments shall be transverse over the torque box, to the opposite side of the body. The transverse area shall be as large as possible. The on the right (officer's) side compartment shall include this transverse option.</p>		
<p><b><u>DOORS, SIDE COMPARTMENTS</u></b>  All hinged compartment doors shall be lap style with double panel construction and shall be a minimum of 1.50" thick. The compartment doors shall be constructed of the same material as the body. To provide additional door</p>		

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Bidder  
Complies

Yes	No
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strength, a "C" section reinforcement shall be installed between the outer and interior panels.

Doors shall be provided with a closed cell rubber gasket around the surface that laps onto the body. A second heavy-duty automotive rubber molding with a hollow core shall be installed on the door framing that seals onto the interior panel, to ensure a weather resisting compartment.

All compartment doors shall have polished stainless steel continuous hinge with a pin diameter of .25", that is bolted or screwed on with stainless steel fasteners. (Hinges which are welded on shall not be acceptable.) A dielectric substance shall be applied to each hinge fastener.

All door lock mechanisms shall be fully enclosed within the door panels to prevent fouling of the lock in the event equipment inside shifts into the lock area.

Doors shall be latched with recessed, polished stainless steel "D" ring handles and Eberhard 106 locks.

To prevent corrosion caused by dissimilar metals, compartment door handles shall not be attached to outer door panel with screws. A rubber gasket shall be provided between the "D" ring handle and the door.

## COMPARTMENT LIGHTING

There shall be nine (9) compartments with On Scene Solutions LED compartment light strips. The strips shall be centered vertically along each side of the door framing. The compartments with these strip lights shall be located on the inside lip of each compartment.

Opening the compartment door shall automatically turn the compartment lighting on.

## COMPARTMENT LIGHTING

There shall be a total of one (1) 45" long LED On Scene Solutions Night Stick compartment light(s) provided in compartments in the Stokes basket compartment.

The light(s) shall be provided horizontally in the compartment.

Opening the compartment door shall automatically turn the compartment lighting on.

## REAR BUMPER

A 5.00" rear bumper shall be furnished. Bumper shall be constructed of steel framework and shall be covered with polished aluminum treadplate. The bumper shall be 4.00" deep x 5.00" high and shall be spaced away from the body approximately 1.00". It shall extend the full width of the body. The corners of the bumper shall be angled at 30 degrees.

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Complies  
Yes No

The treadplate cover shall be constructed of three (3) separate pieces so that they can more easily be removed if damaged.

## PULL STRAP, DOORS

The one (1) compartment door, located P-3, shall be provided with pull straps.

## DOOR FRAME SCUFFPLATE

Eight (8) scuffplates shall be provided for the lower door frame of on each equipment compartment lip. Each scuffplate shall be polished stainless steel with a .38" lip down.

## SCUFFPLATE ON INTERIOR OF COMPARTMENT DOOR(S)

The 12 compartment doors shall include a polished stainless steel scuffplate to cover the entire width and height on the inside panel of each door pan.

Scuffplate shall be located on the inside of each equipment compartment door.

## ADJUSTABLE SHELVES

There shall be ten (10) shelves, with a capacity of 500 pounds provided. The shelf construction shall consist of 12 gauge stainless steel with 2.00" sides. Each shelf shall be infinitely adjustable by means of a threaded fastener, which slides in a track. Each shelf shall be painted to match the compartment interior.

The location of the shall be one (1) in P-1, one (1) in P-2, two (2) in P-4, three (3) in the transverse section in P-5, one (1) in D-1, one (1) in D-2, one (1) in D-3.

## MOUNTING TRACKS

There shall be seven (7) sets of tracks for mounting shelf(s) in each required compartment. These tracks shall be installed vertically to support the adjustable shelf(s), and shall be full height of the compartment. The tracks shall be painted to match the compartment interior.

## PULL-OUT TRAY

There shall be one (1) slide-out tray, without sides, and a capacity of 500 pounds provided. Capacity rating shall be in the extended position.

Slides shall be General Device ball bearing type, for ease of operation and years of dependable service.

Automatic locks shall be provided for both the "in" and "out" positions. The trip mechanism for it shall be located at the front of the tray for ease of use with a gloved hand.

Tray location shall be one (1) in D-1.

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	Yes	No
<p>Heavy-duty steel angle iron assembly shall support the body under the compartment floor. It shall be attached to the chassis frame for load transfer and to reduce stress on body.</p> <p><b><u>PULL-OUT TRAY</u></b>  There shall be two (2) slide-out trays with 2.00" sides and a capacity of 500 pounds provided. Capacity rating shall be in the extended position.</p> <p>Slides shall be General Device ball bearing type for ease of operation and years of dependable service.</p> <p>Automatic locks shall be provided for both the "in" and "out" positions. The trip mechanism for it shall be located at the front of the tray for ease of use with a gloved hand.</p> <p>Tray location shall be one (1) in P-1 and one (1) in P-3 on the floor of the transverse section.</p> <p>Heavy-duty steel angle iron assembly shall support the body under the compartment floor. It shall be attached to the chassis frame for load transfer and to reduce stress on body.</p> <p><b><u>COMPARTMENT FLOOR SCUFFPLATE</u></b>  Aluminum treadplate shall be provided on the floor of two (2) compartments. The locations shall be, in each 500# tray equipped compartment.</p> <p>The edges of the treadplate shall be completely caulked before installation to prevent corrosion.</p> <p><b><u>MATTING, COMPARTMENT FLOOR</u></b>  Turtle Tile compartment matting shall be provided in 12 compartments on the compartment floor. The locations are, in each equipment compartment.</p> <p>The Turtle Tile shall be gray and the leading edge of the matting shall include the beveled edge.</p> <p><b><u>MATTING, COMPARTMENT SHELVING</u></b>  Turtle Tile compartment matting shall be provided in 18 shelves. The locations are, on each shelf and tray.</p> <p>The color of Turtle Tile shall be gray.</p> <p><b><u>REAR WALL</u></b>  The entire rear surface of the apparatus and all the doors shall be covered with smooth aluminum.</p>		

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	Yes	No
<p><b><u>COMPARTMENT LINED W/ STAINLESS</u></b>  The compartment floor and walls of the compartment in P-1 shall be lined with polished stainless steel. The pan on the floor shall have at least a 0.50" lip on all four sides, including the door opening, to prevent the oil from seeping out onto the exterior paint. The walls of the compartment shall be lined with stainless steel from the top of the lip to the ceiling.</p> <p><b><u>MOUNTING TRACKS</u></b>  There shall be two (2) sets of tracks for mounting equipment. These tracks shall be installed horizontally on the back wall of the compartment(s).   The compartment(s) with mounting tracks shall be in the upper part of P-1 and P-4.</p> <p><b><u>BODY FENDER CROWNS</u></b>  Stainless steel fender crowns shall be provided around the rear wheel openings. A rubber welting shall be provided between the body and the crown to seal the seam and restrict moisture from entering.</p> <p><b><u>HANDRAILS</u></b>  - Four (4) handrails shall be provided mounted one (1) each side underneath the cab windshields and one (1) each side underneath the rear facing jump seats at a 45 degree angle.</p> <p><b><u>AIR BOTTLE STORAGE</u></b>  A total of six (6) air bottle compartments shall be provided. three (3) on each side of the fire body. The air bottle compartment shall be in the form of a round tube (7.63" diameter minimum) and of adequate depth to accommodate different size air bottles. Flooring shall be Dur-a-Surf lined and have a drain hole. A stainless steel door with a chrome plated latch shall be provided to contain the air bottle. A dielectric barrier shall be provided between the door hinge, hinge fasteners (screws) and the body sheet metal.   A stainless steel scuffplate shall be provided around each air bottle compartment opening. The scuffplates shall not be visible when the air bottle compartment door is closed.</p> <p><b><u>SIDE STACKED LADDERS</u></b>  The following ladders shall be side-stacked on the driver side catwalk in place of the hosebed:  - One (1) 35' 2-section ladder, Duo Safety 1200-A  - One (1) 28' 2-section ladder, Duo Safety 1200-A  - One (1) 17' Little Giant Model 10102   The 35' 2-section ladder shall extend forward over the top of the front stabilizer. The body side sheet shall be full depth to accommodate the side-stacked ladders. The Little Giant Ladder shall be stowed at the front above the 35' 2-section ladder.</p>		

Cambridge Fire Department Apparatus Specification	Bidder Complies	
	Yes	No
<p><b><u>AERIAL EXTENSION LADDERS</u></b></p> <p>There shall be one (1) 40', three (3) section aluminum Duo-Safety Series 1525-A extension ladder provided. The ladder shall not have poles and shall be located in the torque box.</p> <p><b><u>EXTENSION LADDER</u></b></p> <p>There shall be two (2) 35', two (2) section, aluminum, Duo-Safety, Series 1200-A extension ladder(s) provided.</p> <p><b><u>ADDED EXTENSION LADDER</u></b></p> <p>There shall be one (1) 28', two (2) section, aluminum, Duo-Safety Series 1200A extension ladder provided.</p> <p><b><u>ROOF LADDER</u></b></p> <p>There shall be two (2), 16' aluminum, Duo-Safety, Series 875-A roof ladders provided.</p> <p><b><u>ADDED ROOF LADDER</u></b></p> <p>There shall be one (1) 18' roof, aluminum, Series 875-A provided.</p> <p><b><u>ATTIC EXTENSION LADDER, AERIAL</u></b></p> <p>There shall be one (1) 14' Fresno, aluminum, Duo-Safety, Series 701 extension ladder(s) provided.</p> <p><b><u>FOLDING LADDER, AERIAL</u></b></p> <p>There shall be one (1) 10' aluminum, Duo-Safety, Series 585-A folding ladder(s) provided.</p> <p><b><u>GROUND LADDER STORAGE</u></b></p> <p>The ground ladders are stored within the torque box and are removable from the rear.</p> <p>Ladders shall be enclosed to prevent road dirt and debris from fouling or damaging the ladders.</p> <p>The ladders rest in full length stainless steel slides and are arranged in such a manner that any one ladder can be removed without having to move or remove any other ladder.</p> <p>A Gortite roll-up door shall be provided at the rear, double faced, aluminum construction, an anodized satin finish and manufactured by A&amp;A Manufacturing (Gortite). The latching mechanism shall consist of a full length lift bar lock with latches on the outer extrusion of the door frame.</p>		

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	Yes	No
<p>A stainless plate with a two bend flange and a stainless steel hinge shall be provided to secure the aerial ladder complement. The plate assembly shall be mounted to the bottom of the entrance of the torque box ladder storage area.</p> <p>When the plate is vertical, it shall secure the ladders and prevent them from migrating to the rear of the apparatus. When the plate is down and not securing the ladders, the roll-up door cannot close, which shall activate the "Open Door Indicator Light" within the cab. The roll-up door together with hinge friction shall secure the plate in place during driving operations.</p> <p>A door guard shall be provided to prevent tools inside the torque box from damaging the roll-up door.</p> <p>One (1) Model 10102 Little Giant folding ladder shall be provided. The stored dimensions shall be 55.00" high x 24.50" wide x 8.00" deep. The weight shall be 35 pounds.</p> <p>The ladder shall be located on the left (driver's) side.</p> <p><b><u>DURA-SURF LADDER SLIDES</u></b></p> <p>Black Dura-Surf friction reducing material shall be added to the stainless steel slides, on the bottom horizontal surfaces, of the ladder storage rack.</p> <p><b><u>PIKE POLES</u></b></p> <p>There shall be two (2) Fire Hooks Unlimited, Model APH-12, 12' pike pole(s) with fiberglass handles provided. The pike pole(s) shall be located in the torque box.</p> <p><b><u>PIKE POLE 8 FT</u></b></p> <p>There shall be three (3) Fire Hooks Unlimited APH-8, 8 foot pike pole(s) with fiberglass handles provided two (2) in the torque box and one (1) on the aerial fly section.</p> <p><b><u>PIKE POLE, 6'</u></b></p> <p>There shall be two (2) Fire Hooks Unlimited #APH-6, 6 foot pike pole(s) with fiberglass handles provided and located in the torque box.</p> <p><b><u>PIKE POLE 3 FT, PROVIDED BY FIRE DEPARTMENT</u></b></p> <p>NFPA 1901, 2009 edition, Section 8.8.2 requires four (4) pike poles mounted in brackets fastened to the apparatus.</p> <p>The pike poles are not on the apparatus as manufactured. The fire department shall provide and mount the pike poles.</p> <p>There shall be two (2) 3 foot pike pole(s) provided.</p>		

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	Yes	No
<p><b><u>ELECTRICAL HARNESSING INSTALLATION</u></b></p> <p>To ensure rugged dependability, all 12-volt wiring harnesses installed by the apparatus manufacturer shall conform to the following specifications:</p> <p>SAE J1128 - Low tension primary cable</p> <p>SAE J1292 - Automobile, truck, truck-tractor, trailer and motor coach wiring</p> <p>SAE J163 - Low tension wiring and cable terminals and splice clips</p> <p>SAE J2202 - Heavy duty wiring systems for on-highway trucks</p> <p>NFPA 1901 - Standard for automotive fire apparatus</p> <p>FMVSS 302 - Flammability of interior materials for passenger cars, multipurpose passenger vehicles, trucks and buses</p> <p>SAE J1939 - Serial communications protocol</p> <p>SAE J2030 - Heavy-duty electrical connector performance standard</p> <p>SAE J2223 - Connections for on board vehicle electrical wiring harnesses</p> <p>NEC - National Electrical Code</p> <p>SAE J561 - Electrical terminals - Eyelet and spade type</p> <p>SAE J928 - Electrical terminals - Pin and receptacle type A</p> <p>Wiring shall be run in loom where exposed, and have grommets or other edge protection where wires pass through metal. Wiring shall be color, function and number coded. Wire colors shall be integral to each wire insulator and run the entire length of each wire. Harnessing containing multiple wires and uses a single wire color for all wires shall not be allowed. Function and number codes shall be continuously imprinted on all wiring harness conductors at 2.00" intervals. All wiring installed between the cab and into doors shall be enclosed within an expandable rubber boot to protect the wiring. Exterior exposed wire connectors shall be positive locking, and environmentally sealed to withstand elements such as temperature extremes, moisture and automotive fluids. Electrical wiring and equipment shall be installed utilizing the following guidelines:</p> <ol style="list-style-type: none"> <li>1. All wire ends not placed into connectors shall be sealed with a heat shrink end cap. Wires without a terminating connector or sealed end cap shall not be allowed. All holes made in the roof shall be caulked with silicon. (no exception). Large fender washers, liberally caulked, shall be used when fastening equipment to the underside of the cab roof. Any electrical component that is installed in an exposed area shall be mounted in a manner that shall not allow moisture to accumulate in it. Exposed area shall be defined as any location outside of the cab or body. For low cost of ownership, electrical components designed to be removed for maintenance shall be quickly accessible. For ease of use, a</li> </ol>		

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Bidder -  
Complies

Yes No

coil of wire shall be provided behind the appliance to allow them to be pulled away from the mounting area for inspection and service work. Corrosion preventative compound shall be applied to non-waterproof electrical connectors located outside of the cab or body. All non-waterproof connections shall require this compound in the plug to prevent corrosion and for easy separation of the plug. Any lights containing non-waterproof sockets in a weather-exposed area shall have corrosion preventative compound added to the socket terminal area. All electrical terminals in exposed areas shall have DOW 1890 protective Coating applied completely over the metal portion of the terminal. Rubber coated metal clamps shall be used to support wire harnessing and battery cables routed along the chassis frame rails. Heat shields shall be used to protect harnessing in areas where high temperatures exist. Harnessing passing near the engine exhaust shall be protected by a heat shield.

All braided wire harnesses shall have a permanent label attached for easy identification of the harness part number and fabrication date.

## BATTERY CABLE INSTALLATION

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

SAE J1127 - Battery Cable

SAE J561 - Electrical terminals, eyelets and spade type

SAE J562 - Nonmetallic loom

SAE J836A - Automotive metallurgical joining

SAE J1292 - Automotive truck, truck-tractor, trailer and motor coach wiring

NFPA 1901 - Standard for automotive fire apparatus

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

1. All battery cables and battery harnesses shall have a permanent label attached for easy identification of the harness part number and fabrication date. Splices shall not be allowed on battery cables or battery cable harnesses. For ease of identification and simplified use, battery cables shall be color coded. All positive battery cables shall be red in color or wrapped in red loom the entire length of the cable. All negative battery cables shall be black in color. For ease of identification, all positive battery cable isolated studs throughout the cab and chassis shall be red in color.

For increased reliability and reduced maintenance, all electrical buss bars located on the exterior of the apparatus shall be coated to prevent corrosion.

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	Yes	No
<p><b><u>ELECTRICAL COMPONENT INSTALLATION</u></b></p> <p>All lighting used on the apparatus shall be, at a minimum, a two (2) wire light grounded through a wired connection to the battery system. Lights using an apparatus metal structure for grounding shall not be allowed.</p> <p>An operational test shall be conducted to ensure that any equipment that is permanently attached to the electrical system is properly connected and in working order. The results of the tests shall be recorded and provided to the purchaser at time of delivery.</p> <p><b><u>CAB PERIMETER SCENE LIGHTS</u></b></p> <p>There shall be four (4) Truck-lite, Model 44308C, 4.00" white LED lights with Model 40700 grommets provided, one (1) for each cab and crew cab door.</p> <p>These lights shall be activated automatically when the battery switch is on and the exit doors are opened or by the same means as the body perimeter scene lights.</p> <p><b><u>PERIMETER SCENE LIGHTS, BODY</u></b></p> <p>The perimeter scene lights shall be provided as part of a ground illuminating rubrail system. The lights shall be On Scene LED Night Stiks. The lights shall be mounted directly behind the aluminum rubrail and placed under the bottom edge of the side compartments. The rubrail shall also include red and white conspicuity tape.</p> <p>The lighting shall be capable of providing illumination at a minimum level of two (2) foot-candles on ground areas within 30.00" of the edge of the apparatus in areas designed for personnel to climb onto the apparatus or descend from the apparatus to the ground level.</p> <p>The lights shall be activated by parking brake control, transmission in reverse and turn signal with three (3) to five (5) second delay.</p> <p><b><u>STEP LIGHTS</u></b></p> <p>All steps on the apparatus shall be illuminated per the current edition of NFPA 1901.</p> <p><b><u>REAR ID/MARKER DOT LIGHTING</u></b></p> <p>The three (3) identification lights located at the rear shall be installed per the following:</p> <ul style="list-style-type: none"> <li>• LED light</li> <li>• As close as practical to the vertical centerline.</li> <li>• Centers spaced not less than six (6) inches or more than twelve (12) inches apart.</li> <li>• Red in color.</li> </ul>		

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	Yes	No
<ul style="list-style-type: none"> <li>• All at the same height.</li> </ul> <p>The four (4) clearance lights located at the rear shall be installed per the following:</p> <ul style="list-style-type: none"> <li>• LED light</li> <li>• To indicate the overall width of the vehicle.</li> <li>• One (1) each side of the vertical centerline.</li> <li>• All at the same height.</li> <li>• As near the top as practical.</li> <li>• To be visible from the rear and the side.</li> <li>• One (1) each side, facing the side.</li> <li>• One (1) each side, facing the rear.</li> </ul> <p>Per FMVSS 108 and CMVSS 108 requirements.</p> <p><b><u>MARKER LIGHTS</u></b>  There shall be one (1) light of amber Ri-Tar LED marker light surface mounted on the front face of the turntable console visible to the driver in the mirror on the apparatus.</p> <p>The lights shall be activated by the headlight switch.</p> <p><b><u>LIGHT, INTERMEDIATE</u></b>  There shall be one (1) pair, of Truck-Lite, Model: 60115Y, amber, LED, turn signal, marker lights furnished, one (1) each side, horizontally in the rear fender panel.</p> <p>A stainless steel trim shall be included with this installation.</p> <p><b><u>MARKER LIGHTS</u></b>  There shall be two (2) pairs of amber and red LED marker lights with rubber arm, located one (1) each side between the split handrails mounted on a diamondtread box and on the front face of the turntable console visible to the driver in the mirror. The amber lens shall face the front and the red lens shall face the rear of the truck.</p> <p>These lights shall be activated with the running lights of the vehicle.</p> <p><b><u>REAR FMVSS LIGHTING</u></b>  The rear stop/tail and directional LED lighting shall consist of the following:</p> <p>Two (2) Whelen Model M6BTT red LED stop/tail lights.</p> <p>Two (2) Whelen Model M6T amber LED arrow turn lights.</p>		

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	Yes	No
<p>Each light shall be installed in a housing and include colored lenses.</p> <p>Four (4) red reflectors shall be provided.</p> <p>A 16 gauge stainless steel license plate bracket shall be mounted on the driver's side above the warning lights.</p> <p>A white LED step lamp shall illuminate the license plate. A polished stainless steel light shield shall be provided over the light that shall direct illumination downward, preventing white light to the rear.</p> <p><b><u>BACKUP LIGHTS</u></b>  There shall be two (2) Whelen, Model: M6BUW, LED backup lights provided in the tail light housing.</p> <p><b><u>LIGHTING BEZEL</u></b>  There shall be two (2) Whelen, Model M6FCV4P , four (4) place chromed ABS housings with Pierce logos provided for the rear M6 series stop/tail, directional, back up, scene lights or warning lights.</p> <p><b><u>"DO NOT MOVE APPARATUS" INDICATOR</u></b>  A Whelen Model 5SR00FRR flashing red LED indicator light, located in the driving compartment, shall be illuminated automatically per the current NFPA requirements. The light shall be labeled "Do Not Move Apparatus If Light Is On".</p> <p>The same circuit that activates the Do Not Move Apparatus indicator shall activate a steady tone alarm when the parking brake is released.</p> <p><b><u>DO NOT MOVE TRUCK MESSAGES</u></b>  Messages shall be displayed on the gauge panel LCD located forward of the steering wheel directly in front of the driver whenever the Do Not Move Truck light is active. The messages shall designate the item or items not in the stowed for vehicle travel position (parking brake disengaged).</p> <p>The following messages shall be displayed (where applicable):</p> <ul style="list-style-type: none"> <li>Do Not Move Truck</li> <li>DS Cab Door Open (Driver Side Cab Door Open)</li> <li>PS Cab Door Open (Passenger's Side Cab Door Open)</li> <li>DS Crew Cab Door Open (Driver Side Crew Cab Door Open)</li> <li>PS Crew Cab Door Open (Passenger's Side Crew Cab Door Open)</li> <li>DS Body Door Open (Driver Side Body Door Open)</li> <li>PS Body Door Open (Passenger's Side Body Door Open)</li> <li>Rear Body Door Open</li> </ul>		

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	Yes	No
<p>DS Ladder Rack Down (Driver Side Ladder Rack Down)</p> <p>PS Ladder Rack Down (Passenger Side Ladder Rack Down)</p> <p>Deck Gun Not Stowed</p> <p>Lt Tower Not Stowed (Light Tower Not Stowed)</p> <p>Hatch Door Open</p> <p>Fold Tank Not Stowed (Fold-A-Tank Not Stowed)</p> <p>Aerial Not Stowed (Aerial Device Not Stowed)</p> <p>Stabilizer Not Stowed</p> <p>Steps Not Stowed</p> <p>Handrail Not Stowed</p> <p>Any other device that is opened, extended, or deployed that creates a hazard or is likely to cause major damage to the apparatus if the apparatus is moved shall be displayed as a caution message after the parking brake is disengaged.</p> <p><b><u>CORNERING/SCENE LIGHTS</u></b></p> <p>There shall be one (1) pair of Whelen 600 halogen lights with flanges and 13 degree internal optics lens provided on the apparatus.</p> <p>The lights shall be provided one (1) each side above the rear outriggers.</p> <p>The halogen lights shall be wired so they activate and cancel with the directional lights, and include a delay, cancel with the 4-way flashers and activate by a switch in the cab.</p> <p>These lights shall also activate with the other side scene light on the apparatus.</p> <p><b><u>12 VOLT LIGHTING</u></b></p> <p>There shall be two (2) Whelen Pioneer Model PFP2, 12 volt LED floodlight(s) provided on the front visor, one (1) on the driver's side and one (1) on the passenger's side.</p> <p>The light(s) shall be controlled in the following way:</p> <ul style="list-style-type: none"> <li>a switch at the driver's side switch panel</li> <li>a switch at the passenger's side switch panel</li> <li>no additional switch location</li> </ul> <p>These lights may be load managed when the parking brake is applied.</p> <p><b><u>12 VOLT LIGHT BRACKET</u></b></p> <p>There shall be two (2) painted smooth aluminum bracket(s) installed one (1) on each side of the crew cab towards the rear for the surface mounted flood light. The bracket(s) shall have all wiring totally enclosed.</p>		

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	Yes	No
<p><b><u>12 VOLT LIGHTING</u></b>  There shall be one (1) Whelen Model PCP2, 12 volt LED combination spotlight and floodlight(s) installed in semi-recessed housing(s) Model PBA203 located on the left (driver's) side on the crew cab towards the rear.</p> <p>The light(s) selected above shall be controlled by the following:</p> <ul style="list-style-type: none"> <li>a switch at the driver's side switch panel</li> <li>a switch at the passenger's side switch panel</li> <li>no additional switch location</li> <li>no additional switch location</li> </ul> <p>These light(s) may be load managed when the parking brake is set</p>		
<p><b><u>12 VOLT LIGHTING</u></b>  There shall be one (1) Whelen Model PCP2, 12 volt LED combination spotlight and floodlight(s) installed in semi-recessed housing(s) Model PBA203 located on the right (officer's) side on the crew cab towards the rear.</p> <p>The light(s) selected above shall be controlled by the following:</p> <ul style="list-style-type: none"> <li>a switch at the driver's side switch panel</li> <li>a switch at the passenger's side switch panel</li> <li>no additional switch location</li> <li>no additional switch location</li> </ul> <p>These light(s) may be load managed when the parking brake is set</p>		
<p><b><u>WORK LIGHTS</u></b>  Two (2)-6.00" Unity AG deck lights shall be provided at the rear of the apparatus. The lights shall be furnished with a halogen flood bulb.</p>		
<p><b><u>REAR SCENE LIGHTS</u></b>  One (1) pair of Weldon 2020-1190-30, 50 watt, rectangular, sealed beam rear scene lights shall be provided one (1) each side underneath the rear turn signal cluster.</p> <p>The control for the lights shall be from the first switch feature, a control at the driver side switch panel and from the second switch feature, there is no control of this option.</p>		
<p><b><u>HAND HELD SPOTLIGHT</u></b>  There shall be one (1) spotlight provided which shall be a Collins, Model CL-12-M hand held spot/flood light(s) installed the bracket and light will be shipped loose. The light(s) shall be furnished with a 9 foot coil cord and momentary switch. The housing shall be made from aircraft aluminum that</p>		

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	Yes	No
<p>is powder coat painted black. The mounting bracket shall be fabricated from stainless steel.</p> <p><b><u>HAND HELD SPOTLIGHT</u></b>  There shall be Koehler, Model: #5002*, light and charger units shipped loose. There shall be five (5) lights provided.</p> <p>The color shall be orange.</p> <p>The charger shall be connected to a power point plug, 12 VDC.</p>		

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<p><b><u>AIR HORN SYSTEM</u></b> Two (2) Grover air horns shall be provided and located, in the front bumper, recessed one (1) each side. The horn system shall be piped to the air brake system wet tank utilizing 0.38" tubing. A pressure protection valve shall be installed in-line to prevent loss of air in the air brake system.</p> <p><b><u>AIR HORN CONTROL</u></b> Two (2) lanyard rope pull controls shall be provided, one (1) within reach of the driver and one (1) within reach of the officer.</p> <p><b><u>ELECTRONIC SIREN</u></b> A Federal, model 690010, PA300-012MSC, electronic siren with noise canceling microphone shall be provided.  Siren head shall be located on a swivel bracket mounted on the headliner so that it is accessible to both the driver and officer. The swivel bracket shall be capable of rotating a minimum of 180 degrees.  Siren shall be actuated by a foot switch on the officer's side and by the horn button in the steering wheel. The driver shall have the option to control the siren or the chassis horns from the horn button by means of a selector switch.</p> <p><b><u>SPEAKER</u></b> There shall be one (1) speaker provided. Each speaker shall be a Federal, model CP100-S, 100 watt, with chrome finish. Each speaker shall be connected to the siren amplifier.  The speaker shall be mounted on top of the front bumper on the passenger's side.  <b>The speaker shall be set back 2.00" from standard mounting.</b></p> <p><b><u>MECHANICAL SIREN, (Auxiliary)</u></b> A Federal Q2B siren shall be furnished. A siren brake button shall be installed on the switch panel.  The control solenoid shall be powered up after the emergency master switch is activated.  <b>The mechanical siren shall be mounted on the bumper deckplate, set back 2.00" from the front face of the bumper. It shall be mounted on the left side. The siren mounting shall include a reinforcement plate.</b>  The mechanical siren shall be actuated by a foot switch on the officer's side and by the horn button in the steering wheel. The driver shall have the option to control the siren or the chassis horns from the horn button by means of a selector switch located on the instrument panel.</p>		

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	Yes	No
<p><b><u>LIGHTBARS (Cab Roof)</u></b></p> <p>There shall be two (2) 24.00" Whelen, Model FNMINI LED lightbars shall be mounted on the cab roof, one (1) on each side, above the driver's and passenger's door, facing forward.</p> <p>Each lightbar shall include the following:</p> <ul style="list-style-type: none"> <li>• One (1) red flashing LED module facing forward.</li> <li>• Two (2) red flashing corner LED module, one in each front corner.</li> <li>• One (1) red flashing LED module on the end facing to the side.</li> </ul> <p>All the lenses shall be the same color as the LED's.</p> <p>There shall be one (1) switch, located in the cab, to control these lights.</p> <p><b><u>WARNING LIGHTS (Cab Face)</u></b></p> <p>Four (4) Whelen Model M6* LED flashing warning lights shall be installed on the cab face, above the headlights, mounted in a common bezel.</p> <p>The driver's side front outside warning light to be red.</p> <p>The driver's side front inside warning light to be red.</p> <p>The passenger's side front inside warning light to be red.</p> <p>The passenger's side front outside warning light to be red.</p> <p>All four (4) lights shall include a colored lens that is the same color of the LED's.</p> <p>All four (4) lights shall be controlled by a lighted switch in the cab on the switch panel.</p> <p>The inside lights may be load managed if colored or disabled if white, when the parking brake is set.</p> <p><b><u>SIDE ZONE LOWER LIGHTING</u></b></p> <p>Six (6) Whelen Model M6* LED flashing warning lights with bezels shall be located in the following positions:</p> <p>Two (2) lights, one (1) each side on the bumper extension.</p> <p>The side front lights to be red.</p> <p>Two (2) lights, one (1) each side on the crew cab extension.</p> <p>The side middle lights to be red.</p> <p>Two (2) lights, one (1) each side above the rear wheels.</p> <p>The side rear lights to be red.</p> <p>All six (6) lights shall include a lens that is the same color of the LED's.</p>		

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Yes No

All six (6) lights shall be controlled by a lighted switch on the cab switch panel.

**REAR ZONE LOWER LIGHTING**

Two (2) Whelen, Model M6\* LED flashing warning lights shall be located at the rear of the apparatus.

The driver's side rear light to be blue.

The passenger's side rear light to be red.

Both lights shall include a lens that is the same color as the LED's.

Both lights shall be controlled by a lighted switch on the switch panel.

**WARNING LIGHTS (Rear of Hose Bed)**

Two (2) Whelen L31H\*FN LED warning beacons shall be provided at the rear of the truck, located one (1) each side. These lights shall be activated by a lighted switch on the instrument panel.

The color of the lights shall be red LEDs with both domes red.

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	Yes	No
<p><b><u>ELECTRICAL SYSTEM GENERAL DESIGN for ALTERNATING CURRENT</u></b></p> <p>The following guidelines shall apply to the 120/240 VAC system installation:</p> <p><u>General</u></p> <p>Any fixed line voltage power source producing alternating current (ac) line voltage shall produce electric power at 60 cycles plus or minus 5 cycles.</p> <p>Except where superseded by the requirements of NFPA 1901, all components, equipment and installation procedures shall conform to NFPA 70, National Electrical Code (herein referred to as the NEC).</p> <p>Line voltage electrical system equipment and materials included on the apparatus shall be listed and installed in accordance with the manufacturer's instructions. All products shall be used only in the manner for which they have been listed.</p> <p><u>Grounding</u></p> <p>Grounding shall be in accordance with Section 250-6 "Portable and Vehicle Mounted Generators" of the NEC. Ungrounded systems shall not be used. Only stranded or braided copper conductors shall be used for grounding and bonding.</p> <p>An equipment grounding means shall be provided in accordance with Section 250-91 (Grounding Conductor Material) of the NEC.</p> <p>The grounded current carrying conductor (neutral) shall be insulated from the equipment grounding conductors and from the equipment enclosures and other grounded parts. The neutral conductor shall be colored white or gray in accordance with Section 200-6 (Means of Identifying Grounding Conductors) of the NEC.</p> <p>In addition to the bonding required for the low voltage return current, each body and driving or crew compartment enclosure shall be bonded to the vehicle frame by a copper conductor. This conductor shall have a minimum amperage rating of 115 percent of the nameplate current rating of the power source specification label as defined in Section 310-15 (amp capacities) of the NEC. A single conductor properly sized to meet the low voltage and line voltage requirements shall be permitted to be used.</p> <p>All power source system mechanical and electrical components shall be sized to support the continuous duty nameplate rating of the power source.</p> <p><u>Operation</u></p> <p>Instructions that provide the operator with the essential power source operating instructions, including the power-up and power-down sequence, shall be permanently attached to the apparatus at any point where such operations can take place.</p>		

Cambridge Fire Department Apparatus Specification	Bidder Complies	
	Yes	No
<p>Provisions shall be made for quickly and easily placing the power source into operation. The control shall be marked to indicate when it is correctly positioned for power source operation. Any control device used in the drive train shall be equipped with a means to prevent the unintentional movement of the control device from its set position.</p> <p>A power source specification label shall be permanently attached to the apparatus near the operator's control station. The label shall provide the operator with the information detailed in Figure 19-4.10.</p> <p>Direct drive (PTO) and portable generator installations shall comply with Article 445 (Generators) of the NEC.</p> <p><u>Overcurrent protection</u></p> <p>The conductors used in the power supply assembly between the output terminals of the power source and the main over current protection device shall not exceed 144 inches. (3658 mm) in length.</p> <p>For fixed power supplies, all conductors in the power supply assembly shall be type THHW, THW, or use stranded conductors enclosed in nonmetallic liquid tight flexible conduit rated for a minimum of 194 degree Fahrenheit (90 degrees Celsius).</p> <p>For portable power supplies, conductors located between the power source and the line side of the main overcurrent protection device shall be type SO or type SEO with suffix WA flexible cord rated for 600-volts at 194 degrees Fahrenheit (90 degrees Celsius).</p> <p><u>Wiring Methods</u></p> <p>Fixed wiring systems shall be limited to the following:</p> <ul style="list-style-type: none"> <li>- Metallic or nonmetallic liquid tight flexible conduit rated at not less than 194 degrees Fahrenheit (90 degrees Celsius)</li> </ul> <p style="text-align: center;">or</p> <ul style="list-style-type: none"> <li>- Type SO or Type SEO cord with a WA suffix, rated at 600 volts at not less than 194 degrees Fahrenheit (90 degrees Celsius)</li> </ul> <p>Electrical cord or conduit shall not be attached to chassis suspension components, water or fuel lines, air or air brake lines, fire pump piping, hydraulic lines, exhaust system components, or low voltage wiring. In addition the wiring shall be run as follows.</p> <ul style="list-style-type: none"> <li>- Separated by a minimum of 12 inches (305 mm), or properly shielded, from exhaust piping</li> <li>- Separated from fuel lines by a minimum of six (6) inches (152 mm) distance.</li> </ul> <p>Electrical cord or conduit shall be supported within six (6) inches (152 mm) of any junction box and at a minimum of every 24 inches (610 mm) of continuous</p>		

Cambridge Fire Department Apparatus Specification	Bidder Complies	
	Yes	No
<p>run. Supports shall be made of nonmetallic materials or corrosion protected metal. All supports shall be of a design that does not cut or abrade the conduit or cable and shall be mechanically fastened to the vehicle.</p> <p><u>Wiring Identification</u></p> <p>All line voltage conductors located in the main panel board shall be individually and permanently identified. The identification shall reference the wiring schematic or indicate the final termination point. When prewiring for future power sources or devices, the unterminated ends shall be labeled showing function and wire size.</p> <p><u>Wet Locations</u></p> <p>All wet location receptacle outlets and inlet devices, including those on hardwired remote power distribution boxes, shall be of the grounding type provided with a wet location cover and installed in accordance with Section 210-7 "Receptacles and Cord Connections" of the NEC.</p> <p>All receptacles located in a wet location shall be not less than 24 inches (610 mm) from the ground. Receptacles on off-road vehicles shall be a minimum of 30 inches (762 mm) from the ground.</p> <p>The face of any wet location receptacle shall be installed in a plane from vertical to not more than 45 degrees off vertical. No receptacle shall be installed in a face up position.</p> <p><u>Dry Locations</u></p> <p>All receptacles located in a dry location shall be of the grounding type. Receptacles shall be not less than 30 inches (762 mm) above the interior floor height.</p> <p>All receptacles shall be marked with the type of line voltage (120-volts or 240-volts) and the current rating in amps. If the receptacles are direct current, or other than single phase, they shall be so marked.</p> <p><u>Listing</u></p> <p>All receptacles and electrical inlet devices shall be listed to UL 498, Standard for Safety Attachment Plugs and Receptacles, or other appropriate performance standards. Receptacles used for direct current voltages shall be rated for the appropriate service.</p> <p><u>Electrical System Testing</u></p> <p>The wiring and associated equipment shall be tested by the apparatus manufacturer or the installer of the line voltage system.</p> <p>The wiring and permanently connected devices and equipment shall be subjected to a dielectric voltage withstand test of 900-volts for one (1) minute. The test shall be conducted between live parts and the neutral conductor, and between live parts and the vehicle frame with any switches in</p>		

Cambridge Fire Department Apparatus Specification	Bidder Complies	
	Yes	No
<p>the circuit(s) closed. This test shall be conducted after all body work has been completed.</p> <p>Electrical polarity verification shall be made of all permanently wired equipment and receptacles to determine that connections have been properly made.</p> <p><u>Operational Test per Current NFPA 1901 Standard</u></p> <p>The apparatus manufacturer shall perform the following operation test and ensure that the power source and any devices that are attached to the line voltage electrical system are properly connected and in working order. The test shall be witnessed and the results certified by Underwriters Laboratories.</p> <p>The prime mover shall be started from a cold start condition and the line voltage electrical system loaded to 100 percent of the nameplate rating.</p> <p>The power source shall be operated at 100 percent of its nameplate voltage for a minimum of two (2) hours unless the system meets category certification as defined in the current NFPA 1901 standard.</p> <p>Where the line voltage power is derived from the vehicle's low voltage system, the minimum continuous electrical load as defined in the current NFPA 1901 standard shall be applied to the low voltage electrical system during the operational test.</p> <p><b><u>GENERATOR</u></b></p> <p>Model: Westerbeke 8.0 kW, model 8BTDR diesel powered generator</p> <p>Mounting: Permanently</p> <p>Size: 36.10" length x 21.40" width x 24.70" height</p> <p>Weight: 495 pounds</p> <p><u>Fuel Requirements</u></p> <p>The fuel supply shall be the chassis fuel tank or an additional tank if so requested.</p> <p><u>Exhaust</u></p> <p>The muffler shall be supplied outside the compartment. Stainless steel 1.75" flexible tubing shall be used to connect the muffler to the generator. The exhaust discharge shall be directed away from any operators position.</p> <p><u>Type of Cooling System</u></p> <p>The generator shall be liquid cooled and shall be equipped with a pusher fan. The radiator shall be isolated, so that hot air doesn't recirculate back into the compartment.</p> <p><u>Cooling Requirements</u></p>		

# Cambridge Fire Department Apparatus Specification

Bidder  
Complies  
Yes No

The air outlet requirements shall not be less than 310 square inches. The fresh air inlet shall not be less than 272 square inches.

Shutdown: Low oil pressure, high water temp

Continuous Duty Rating: 8,000 watts

Volts: 120/240

Phase: Single

Amperage: 66 amps @ 120 VAC  
33 amps @ 240 VAC

Cycles: 60 HZ

## Generator Instruments and Controls

To properly monitor the generator performance a meter panel shall be furnished and mounted next to the circuit breaker panel. The unit shall be a single phase, three (3)-wire, 120/240-volt series. The following instruments shall be installed in the panel if not specified on the generator:

- One (1) Voltmeter
- Two (2) Ammeters
- One (1) Frequency Meter
- One (1) Hour Meter on the Generator
- One (1) "Power On" Green Indicator Light
- Two (2) Fuse Holders with Two (2) Amp Fuses (for gauge protection)

The gauges and controls shall be installed near eye level in the compartment. Instruments shall be flush mounted in an appropriate sized weatherproof electrical enclosure. All instruments used shall be accurate within +/- Two (2) percent.

## Operating Criteria

A caution tag shall be placed close to the generator stating that the compartment doors must be open during operation.

If the generator is located in a cargo area, the radiator shall be facing the side sheet for the air to escape.

## GENERATOR LOCATION

The generator shall be permanently mounted, in an open area above the torque box, on the left (driver's) side towards the front of the torque box. The oil drain, oil dipstick, fuel filter and oil filter for the generator shall be easily accessible for maintenance. Removable panels and an extended oil drain shall possibly be necessary to meet this requirement.

# Cambridge Fire Department Apparatus Specification

Bidder  
Complies

Yes No

## ELECTRIC START PROVISION

Electric start provisions shall be furnished for the generator from the chassis battery system.

## REMOTE START WITH DISPLAY PANEL FOR WESTERBEKE GENERATOR

Two (2) Westerbeke GenRemote power logic display panels shall be provided. The display panel shall provide generator start/stop capability in the cab and at a remote location along with a digital display of generator performance.

The digital display panel shall include the following items.

- Generator start/stop
- Water temp
- Oil pressure
- Exhaust temp alarm
- Engine hours
- DC voltage
- AC voltage
- Frequency
- Current, Line 1
- Current, Line 2

The display panel dimensions are 7.10" wide by 7.50" high by 2.00" deep.

The switching location shall be in the cab switch panel and near the circuit breaker box.

## ELECTRIC FUEL PUMP

A fuel pick-up tube shall be provided in the chassis fuel tank along with an electric fuel pump for the generator fuel system. A fuel line shall be provided from the fuel tank to the generator with a manual shutoff valve located at the generator.

## GENERATOR OIL DRAIN

The generator oil drain shall extend through the floor exiting below the truck.

## GENERATOR EXHAUST

The generator exhaust shall be routed to the right side of the body near the rear wheels and terminate under the vehicle.

# Cambridge Fire Department Apparatus Specification

Bidder  
Complies

Yes No

## CIRCUIT BREAKER PANEL

A circuit breaker panel shall be installed in the in the right front transverse compartment on the front bulkhead wall. A directory for each breaker shall be provided adjacent to the circuit breaker panel. Identification of circuits shall be done in a durable manner that provides years of service.

## COVER HINGED

A hinged stainless steel cover shall be provided for the Westerbeke One Touch start pad inside the cab, to prevent accidental starts.

## 240 VOLT LIGHTING

A Kwik-Raze Model 1337 light shall be provided. Each light shall have a non-telescopic low clearance permanent mount. The light fixture shall be a single 750 watt, 240 volt, Magnafire 3000 Series unit that draws 3.5 amps.

There shall be Four (4) provided, two (2) each side one (1) at the front of the fire body and one (1) at the rear of the fire body.

## FLOOD LIGHT SWITCHES

Remote on/off actuation switches shall be provided in two (2) locations to control Two (2). These floodlight switches shall be used to actuate the side 240 volt lights. The location of the two (2) switches shall be in the cab in the officer's side switch panel and near the circuit breaker panel

## ELECTRIC CORD REEL

Furnished with the 120 volt AC electrical system shall be a Hannay, series 1600, cord reel. The reel shall be provided with a 12-volt electric rewind switch, that is guarded to prevent accidental operation and labeled for its intended use. The switch shall be protected with a fuse and installed at a height not to exceed 72 inches above the operators standing position.

The exterior finish of the reel(s) shall be painted job color matching the body exterior..

A captive roller assembly to be provided to aid in the payout and loading of the reel. A ball stop shall be provided to prevent the cord from being wound on the reel.

A label shall be provided in a readily visible location adjacent to the reel. The label shall indicate current rating, current type, phase, voltage and total cable length.

A total of one (1) cord reel shall be provided above compartment P-5.

The cord reel should be configured with three (3) conductors.

# Cambridge Fire Department Apparatus Specification

Bidder  
Complies

Yes No

**CORD**

Provided for electric distribution shall be one (1) length installed on the reel of 200 feet of black 10/3 electrical cord. A Hubbell L5-20, 20 amp, 120 volt, twist lock connector body shall be installed on the end of the cord.

**PORTABLE JUNCTION BOX**

There shall be one (1) 120 vac 20 amp #5-20 duplex GFI receptacle and three (3) 120 vac, 20 amp, twist lock #L5-20 receptacles, and a locator/indicator light provided in an outlet box. The junction box construction shall be weatherproof and have flip-up covers lined with soft neoprene rubber at each outlet opening. The junction box shall be a Circle-D, model PF-51 GFCI-3.

A Hubbell L5-20, 20 amp, 120 volt, twist lock connector body.

A total of one (1) shall be provided.

**REEL ENCLOSURE**

An aluminum treadplate enclosure shall be installed over the reel. The enclosure shall be provided with a stainless steel hinge that shall allow the cover to be opened.

A captive roller assembly shall be provided to assist with the payout of the cord. A ball stop shall be provided on the cord to stop the cord at the roller assembly.

A total of one (1) shall be installed .

**20 AMP RECEPTACLE**

Wired to the power supply shall be two (2) receptacles that are a 120 volt 20 amp three wire twist-lock type, Marine Grade NEMA L5-20 Hubbell Model 23CM10 with weather resisting cover located one (1) each side at the rear of the fire body underneath the rear stabilizer controls.

# Cambridge Fire Department Apparatus Specification

Bidder  
Complies

Yes

No

## FOUR (4)-SECTION 105 FOOT AERIAL LADDER

### CONSTRUCTION STANDARDS

The ladder shall be constructed to meet all of the requirements as described in the current NFPA 1901 standards.

The aerial device shall be a true ladder type device; therefore ladders attached to booms shall not be considered.

These capabilities shall be established in an unsupported configuration.

All structural load supporting elements of the aerial device that are made of a ductile material shall have a design stress of not more than 50% of the minimum yield strength of the material based on the combination of the live load and the dead load. This 2:1 structural safety factor meets the current NFPA 1901 standard.

All structural load supporting elements of the aerial device that are made of non-ductile material shall have a design stress of not more than 20% of the minimum ultimate strength of the material, based on the combination of the rated capacity and the dead load. This 5:1 safety factor meets the current NFPA 1901 standard.

Wire ropes and attaching systems used to extend and retract the fly sections shall have a 5:1 safety factor based on the ultimate strength under all operating conditions. The factor of safety for the wire rope shall remain above 2:1 during any extension or retraction stall. The minimum ratio of the diameter of wire rope used to the diameter of the sheave used shall be 1:12. Wire ropes shall be constructed of seven (7) strands over an inner wire core for increased flexibility. The wire rope shall be galvanized to reduce corrosion.

The aerial base pivot bearings shall be maintenance free type bearings and require no external lubrication.

The aerial device shall be capable of sustaining a static load one and one-half times its rated tip load capacity (live load) in every position in which the aerial device can be placed when the vehicle is on a firm level surface.

The aerial device shall be capable of sustaining a static load one and one-third times its rated tip load capacity (live load) in every position the aerial device can be placed when the vehicle is on a slope of five degrees downward in the direction most likely to cause overturning.

With the aerial device out of the cradle in the in the fully extended position at zero degrees elevation, a test load shall be applied in a horizontal direction normal to the centerline of the ladder. The turntable shall not rotate and the ladder shall not deflect beyond what the product specification allows.

All welding of aerial components, including the aerial ladder sections, turntable, pedestal, and outriggers, shall be in compliance with the American

Cambridge Fire Department Apparatus Specification	Bidder Complies	
	Yes	No
<p>Welding Society standards. All welding personnel shall be certified, as qualified under AWS welding codes.</p> <p>The aerial device shall be capable of operating with the maximum rated tip load in either of the two (2) following conditions:</p> <ul style="list-style-type: none"> <li>- Conditions of high wind up to 50 mph</li> <li>- Conditions of icing, up to a coating of .25" over the entire aerial structure</li> </ul> <p>All of the design criteria must be supported by the following test data: (no exception)</p> <ul style="list-style-type: none"> <li>- Strain gage testing of the complete aerial device</li> <li>- Analysis of deflection data taken while the aerial device was under test load</li> </ul> <p>The following standards for materials are to be used in the design of the aerial device:</p> <ul style="list-style-type: none"> <li>- Materials are to be certified by the mill that manufactured the material</li> <li>- Materials that are certified or recertified by vendors other than the mill shall not be acceptable</li> <li>- Material testing that is performed after the mill test shall be for verification only and not with the intent of changing the classification</li> <li>- All welded structural components for the ladder shall be traceable to their mill lots.</li> </ul> <p><b><u>LADDER CONSTRUCTION</u></b></p> <p>The ladder shall be comprised of four sections.</p> <p>The ladder shall have the capability to support a minimum of 500 pounds at the tip in the unsupported configuration, based upon 360 degree rotation, up to full extension and from -8 degrees to +75 degrees.</p> <p>The ladder (handrails, baserails, trusses, K-braces and rungs) shall be constructed of high strength low alloy steel, minimum 70,000 pounds per square inch yield, with full traceability on all structural members.</p> <p>Each section shall be trussed diagonally, vertically and horizontally using welded steel tubing.</p> <p>All ladder rungs shall be round and welded to each section utilizing "K" bracing for torsional rigidity.</p> <p>The inside width dimensions of the ladder shall be:</p> <ul style="list-style-type: none"> <li>- Base Section 39.00"</li> <li>- Inner-Mid Section 32.25"</li> <li>- Outer-Mid Section 26.62"</li> </ul>		

# Cambridge Fire Department Apparatus Specification

Bidder  
Complies

Yes No

- Fly Section 21.62"

The height of the handrails above the centerline of the rungs shall be:

- Base Section 26.75"

- Inner-Mid Section 22.87"

- Outer-Mid Section 20.25"

- Fly Section 17.50"

The ladder shall be designed to provide continuous egress for firefighters and civilians from an elevated position to the ground. The end of the fly section shall be constructed in a manner that aids personnel who are climbing off the ladder.

The egress section shall be designed to maintain the rated load of the aerial device. It shall be bolted on for easy replacement.

## VERTICAL HEIGHT

The ladder shall extend to a minimum height of 105' above the ground at full extension and elevation. The measurement of height shall be consistent with NFPA standards.

## HORIZONTAL REACH

The rated horizontal reach shall be a minimum of 100'. (no exception). The measurement of horizontal reach shall be consistent with NFPA standards.

## TURNTABLE

The upper turntable assembly shall connect the aerial ladder to the turntable bearing. The steel structure shall have a mounting position for the aerial elevation cylinders, ladder connecting pins, and upper turntable operator's position.

The turntable shall be a 1.00" thick steel deck, coated with a non-skid, chemical resistant material in the walking areas. The stepping surfaces shall meet the skid-resistance requirements of the current NFPA 1901 standard.

The turntable platform shall be approximately 95.00" wide x 84.50" long.

The turntable shall be lit to meet current NFPA 1901 requirements. Lights shall be activated by the aerial master switch.

The turntable handrails shall be a minimum 42.00" high and shall not increase the overall travel height of the vehicle. The handrails shall be constructed from aluminum and have a slip resistant knurled surface.

## ELEVATION SYSTEM

Two (2) double acting lift cylinders shall be utilized to provide smooth precise elevation from 8 degrees below horizontal to 75 degrees above horizontal.

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	Yes	No
<p>The lift cylinders shall have a 6.00" internal diameter (bore), .50" wall thickness, 4.50" diameter cylinder rod and a 34.84" stroke.</p> <p>The lift cylinders shall be equipped with integral holding valves located on the cylinder to prevent the unit from falling should the charged lines be severed at any point within the hydraulic system.</p> <p>The lift cylinders shall be mounted utilizing maintenance free spherical bearings on both ends of the cylinders. The bearings shall help reduce pin wear.</p> <p>Ladder tip speed is automatically decelerated when the angle is above 60 degrees, reducing "tip-lash".</p> <p>The pivot pins shall be stainless steel with greaseless bushings and shall be 2.25" in diameter. All elevation pins shall be stainless steel with greaseless ladder pivot pins.</p> <p><b><u>EXTENSION/RETRACTION SYSTEM</u></b></p> <p>A full hydraulic powered extension and retraction system shall be provided using two (2) hydraulic cylinders and wire ropes.</p> <p>Each cylinder is capable of operating the ladder in the event of a failure to the other.</p> <p>The extension cylinder shall have a 3.00" internal diameter (bore), 1.75" diameter rod and a 134.00" stroke.</p> <p>Extension and retraction shall be internally limited within the cylinders, eliminating excess strain on wire ropes, sheaves and the ladder structure.</p> <p>Each of the cylinders, wire ropes and sheave assemblies shall be completely independent of the other, so as to provide a safety factor wherein a failure of one assembly shall not affect the function and operation of the other.</p> <p>The extension cylinders shall be equipped with integral holding valves to prevent the unit from retracting should the charged lines be severed at any point within the hydraulic system.</p> <p>The extension cylinders shall be mounted utilizing maintenance free spherical bearings.</p> <p>The cylinders shall also have internal deceleration valves to cushion the movement of the cylinder when approaching full extension or retraction.</p> <p>The reeling of the wire rope shall be such as to provide synchronized, simultaneous movement of all sections to full extension.</p> <p>The extension/retraction wire ropes shall be: 7-flex galvanized wire rope with stainless steel threaded ends and shall have the following characteristics:</p> <ul style="list-style-type: none"> <li>- Lower mid Section .50" diameter with 26,200# nominal design strength</li> <li>- Mid Section .38" diameter with 14,880# nominal design strength</li> </ul>		

Cambridge Fire Department Apparatus Specification	Bidder Complies	
	Yes	No
<p>- Fly Section .31" diameter with 10,380# nominal design strength</p> <p>Wear pads that are made of polymer material shall be used between the telescoping sections for maximum weight distribution, strength and smoothness of operation.</p> <p>Adjustment screws shall be provided on the wear pads to permit proper side alignment.</p> <p>All sheaves shall be plastic and greaseless and all sheave pins and pivot pins shall be polished stainless steel. (no exception)</p>		
<p><b><u>ROTATION SYSTEM</u></b></p> <p>A 46.00" diameter, external tooth, monorace, slewing ring bearing shall be used for the rotation system. The gear teeth shall be stub tooth form.</p> <p>The bearing shall provide 360 degree continuous rotation.</p> <p>The turntable shall be bolted to the bearing using 36 SAE Grade 8, .875" diameter bolts.</p> <p>To secure the bearing to the torque box, 36 Grade 8, .875" diameter bolts shall be used.</p> <p>The turntable base and the torque box bearing plate shall be machined flat, within .007" thereby providing even distribution of forces.</p> <p>Two hydraulically driven planetary gear boxes will be used to provide infinite and minute rotation control throughout the entire rotational travel.</p> <p>Each planetary gearbox will have a torque rating of 130,000 pounds per inch.</p> <p>Each planetary gearbox will have a spring applied, hydraulically released disc type swing brake to provide positive braking of the turntable assembly.</p>		
<p><b><u>ROTATION INTERLOCK</u></b></p> <p>A permanently installed prevention mechanism shall be provided as part of the rotation system to prevent the rotation of the aerial device to the side in which the stabilizers have not been fully deployed or are short-jacked.</p> <p>The mechanism shall allow full and unrestricted use of the aerial in the 180 degree area on the side(s) where the stabilizers have been fully deployed.</p> <p>The system shall also have a manual override to comply with NFPA 1901.</p> <p>This shall consist of a switch located in the lower control station so that activation shall require two (2) persons (one at an aerial device control location and one at the lower control station).</p> <p>Systems that permit the aerial to rotate to the short jack side without automatically stopping the rotation and/or without actuation of the manual override shall not be accepted. Systems that only include an alarm are not considered an interlock and shall not be accepted.</p>		

# Cambridge Fire Department Apparatus Specification

Bidder  
Complies

Yes No

## TORQUE BOX

A "torsion box" subframe shall be installed between the two (2) sets of stabilizers.

The torque box shall be constructed of .312" thick (minimum) steel plate (50,000 pounds per square inch yield) with steel tubing reinforcement on each side of the box in the turntable area.

The torque box subframe assembly is capable of withstanding all torsional and horizontal loads when the unit is on the stabilizers.

The torque box shall be bolted to the chassis frame rails using 20 SAE Grade 8, .750" bolts with nuts.

## LOAD CAPACITIES

The following load capacities shall be established, with the stabilizers at full horizontal extension and placed in the down position, to level the truck and to relieve the weight from the tires and axles.

Capacities shall be based upon full extension and 360 degree rotation.

A load chart, visible at the operator's station, shall be provided. The load chart shall show the recommended safe load at any condition of the aerial device's elevation and extension. (no exception)

### 50 MPH WIND CONDITIONS/WATERWAY DRY

Degrees of Elevation	-8 to 9	10 to 19	20 to 29	30 to 39	40 to 49	50 to 59	60 to 69	70 to 75
Egress	500	500	500	500	500	500	500	500
Fly	-	-	-	-	250	250	750	1000
Upper Mid	-	-	-	250	250	500	1000	1000
Lower Mid	-	-	250	250	500	750	1000	1000
Base	-	250	500	500	750	1000	1000	1000

### 50 MPH WIND CONDITIONS/WATERWAY CHARGED

Degrees of Elevation	-8 to 9	10 to 19	20 to 29	30 to 39	40 to 49	50 to 59	60 to 69	70 to 75
Egress	500	500	500	500	500	500	500	500
Fly	-	-	-	-	-	250	500	750
Upper Mid	-	-	-	-	250	500	750	1000
Lower Mid	-	-	-	250	500	750	1000	1000

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Bidder  
Complies

Yes	No
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Base	-	-	250	500	750	1000	1000	1000
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**Reduced loads at the tip can be redistributed in 250 lb. increments to the fly, mid, or base sections as needed.**

**BOOM SUPPORT**

A heavy duty boom support shall be provided for support of the ladder in the travel position. On the base section of the ladder, a stainless steel scuffplate shall be provided where the ladder comes into contact with the boom support.

The boom support shall be located just to the rear of the chassis cab, recessed into the transverse compartment in place of pump.

**AERIAL BOOM PANEL**

There shall be one boom panel provided on each side of the aerial ladder base section. The boom panel shall be painted white so as to match the current apparatus.

The boom panels shall be designed so no mounting bolts are in the face of the panel. This shall keep the lettering surface free of holes.

**EXTENSION INDICATOR**

Extension markings and corresponding numerical indicators shall be provided along each inside and outside top rail of the base section of the aerial every ten (10) feet. They shall indicate various positions of extension up to full. Markings and indicators shall be clearly visible to the console operator. To aid in visibility during hours of darkness, the markings and numerical indicators shall be of a red reflective material.

**FOLDING STEPS**

One (1) set of folding steps shall be provided at the tip of the ladder. An additional set of folding steps shall be provided at the base of the fly section. The steps shall be bright finished, non-skid with a luminescent coating that is rechargeable from any light source and can hold a charge for up to 24 hours.

**AERIAL DEVICE RUNG COVERS**

Each rung shall be covered with a secure, heavy-duty, fiberglass pultrusion that incorporates an aggressive, no-slip coating.

The rung covers shall be glued to each rung, and shall be easily replaceable should the rung cover become damaged.

The center portion of each rung cover shall be black and the outside 2.00" edge at each side shall be safety yellow.

Under no circumstances shall the rung covers be fastened to the rungs using screws or rivets (no exception).

Cambridge Fire Department Apparatus Specification	Bidder Complies	
	Yes	No
<p>The rung covers shall have a 10-year, limited warranty.</p> <p><b><u>AXE MOUNTING BRACKETS</u></b>            Brackets shall be provided near the end of the fly section of the aerial ladder for mounting a fire axe. The mounting plates shall be D/A finished aluminum.</p> <p><b><u>LADDER STORAGE MOUNTING BRACKETS</u></b>            Mounting shall be provided on the right side of the aerial device while viewed from the turntable for storage of one (1) roof ladder(s). The bracket(s) shall be located inboard of the boom panel at the base section.</p> <p>The mounting brackets shall accommodate a 16' Duo-Safety 875-A roof ladder as determined by the type of aerial device and the available space.</p> <p><b><u>PIKE POLE MOUNTING BRACKETS</u></b>            Mounting shall be provided near the end of the fly section of the aerial ladder for one (1) pike pole(s).</p> <p>The bracket shall be sized to hold a Fire Hooks Unlimited 8' pike pole.</p> <p><b><u>LOWERED TURNTABLE HANDRAIL</u></b>            The outside turntable handrails shall be lowered to 37.00" in height. The handrail at the turntable console shall be straight with no bends. The handrails at the passenger side shall be offset inward 4.75", just above the center stanchion. The center handrail shall be provided as standard.</p> <p>NFPA 1901, 2009 edition section 19.18.1 states that if the operator's position is on the turntable, the turntable platform shall be provided with a railing at least 42.00" high. Per customer request to have a section of the turntable handrail less than 42.00" the apparatus shall be non-compliant at the time of delivery.</p> <p><b><u>TURNTABLE CONTROL STATION</u></b>            There shall be a turntable control station located on the left hand side of the turntable so the operator shall be able to easily observe the ladder tip while operating the controls. The controls shall permit the operator to regulate the speed of the aerial functions within safe limits (as determined by the manufacturer and NFPA standards). The controls shall be clearly marked and lighted for nighttime operation. A hinged aluminum cover shall be provided. The momentary foot switch located at the turntable control station shall activate the aerial function controls. They are capable of being operated independently or simultaneously.</p> <p>The following controls and indicator lights shall be clearly identified, illuminated, and conveniently located for ease of operation and viewing:</p> <ul style="list-style-type: none"> <li>- Elevation, extension/retraction, and rotation controls</li> <li>- High idle switch</li> <li>- Rung alignment indicator light</li> </ul>		

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Complies

Yes No

- Tip/Tracking lights switch
- Hydraulic system pressure gauge
- Indicator/Alarm test switch
- EPU switch and light
- Operator's load chart
- Stabilizer Not Fully Extended indicator light
- Monitor controls
- Aerial waterway flow meter

There shall also be a minimum of two (2) 12-volt work lights installed on the turntable to illuminate the surrounding area for nighttime operation. The work lights shall be activated by the aerial master switch.

## SWITCH

**There shall be a switch installed that shall activate the Do Not Move Truck Indicator circuit when the battery switch is on, the turntable console cover is opened and the parking brake is released.**

## STABILIZER CONTROL STATION

There shall be two (2) easily accessible control stations, one (1) for driver side stabilizers and one (1) for passenger side stabilizers, located at the rear of the apparatus.

The following controls and indicator lights shall be clearly identified, illuminated, and conveniently located for ease of operation and viewing at each of the control stations except where otherwise noted:

- Left Rear Stabilizer Firm On Ground indicator light (driver side panel only)
- Left Rear Stabilizer Fully Extended Indicator light (driver side panel only)
- Left Rear Stabilizer In/Out switch (driver side panel only)
- Left Rear Stabilizer Up/Down switch (driver side panel only)
- Left Front Stabilizer Firm On Ground indicator light (driver side panel only)
- Left Front Stabilizer Fully Extended indicator light (driver side panel only)
- Left Front Stabilizer In/Out switch (driver side panel only)
- Left Front Stabilizer Up/Down switch (driver side panel only)

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	Yes	No
<ul style="list-style-type: none"> <li>- Right Rear Stabilizer Firm On Ground indicator light (passenger side panel only)</li> <li>- Right Rear Stabilizer Fully Extended indicator light (passenger side panel only)</li> <li>- Right Rear Stabilizer In/Out switch (passenger side panel only)</li> <li>- Right Rear Stabilizer Up/Down switch (passenger side panel only)</li> <li>- Right Front Stabilizer Firm On Ground indicator light (passenger side panel only)</li> <li>- Right Front Stabilizer Fully Extended indicator light (passenger side panel only)</li> <li>- Right Front Stabilizer In/Out switch (passenger side panel only)</li> <li>- Right Front Stabilizer Up/Down switch (passenger side panel only)</li> <li>- Hydraulic emergency power switch</li> <li>- High idle switch</li> </ul> <p><b><u>STABILIZERS</u></b></p> <p>The vehicle shall come equipped with a stabilization system consisting of four (4) hydraulically operated out and down style stabilizers. This system shall meet or exceed all requirements of the NFPA specifications related to stabilization and setup on sloped surfaces.</p> <p>The stabilizer/leveling jacks shall have a maximum spread of 14' measured from the centerline of the jack footpads when the beams are fully extended. The beams shall be 6.88" wide x 9.00" high with 3/4" thick top and bottom plates and 1/2" thick sides of 100,000-PSI minimum yield strength steel. The cylinders shall have pilot-operated check valves with thermal relief designed to insure that the beams shall not drift out of the stowed position during travel. Wear pads shall guide the stabilizers.</p> <p>The horizontal extension cylinders shall be totally enclosed within the beams and shall incorporate telescoping hydraulic tubing to supply the jack cylinder hydraulic power. Stabilizer hydraulic hoses shall remain stationary during operation of the stabilizers to prevent hose wear and potential failure. The cylinders shall be equipped with decelerators to reduce the speed of extension and retraction when the beams are near the fully retracted and extended positions. The stabilizer extension hydraulic cylinders shall have the following dimensions: 2.25" bore, 1.38" rod, and 39.25" stroke.</p> <p>The vertical jack cylinders shall be capable of 12.00" ground penetration. The cylinders shall be supplied with pilot operated check valves on each jack cylinder to hold the cylinder in the stowed or working position, should a charged line be severed at any point in the hydraulic system. For safety, the integral holding valves shall be located in the cylinder base, NOT in the transfer</p>		

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	Yes	No
<p>tube. Vertical jack cylinder rods shall be fully enclosed by a telescoping inner box to protect the cylinder rods from damage. The stabilizer jack hydraulic cylinders shall have the following dimensions: 4.25" bore, 3.00" rod, and 28.88" stroke.</p> <p>Each stabilizer jack shall have a polished stainless steel shield. The stainless steel shield shall be a maximum of 14.00" wide so as to allow the extension of the stabilizer between parked cars or other obstacles. This plate shall serve as a protective guard and a mounting surface for warning lights. The top, forward, and rear edges shall be flanged back 90 degrees for added strength. A 4.00" diameter clear work light shall be provided to illuminate the stabilizer and the ground. Lighting shall automatically activate with the aerial master switch.</p> <p><b><u>STABILIZER PADS</u></b></p> <p>The stabilizer footpad shall be 12.00" in diameter. The footpad shall be attached to the jack cylinder rod by means of a machined ball at the end of the jack cylinder rod which mates to a socket machined into the footpad. The footpad shall have the ability to pivot 20 degrees from horizontal in any direction to allow setup on uneven terrain.</p> <p><b><u>AUXILIARY STABILIZER PADS</u></b></p> <p>An auxiliary ground pad shall be supplied for each stabilizer to provide additional load distribution on soft surfaces. The pads shall be 31" x 26" and made from a lightweight composite material. The ground pressure shall not exceed 75 pounds per square inch when the ground pads are used and the apparatus is fully loaded and the aerial device is carrying its rated capacity in any position. The pads shall be stored in a double stacked configuration, two (2) behind each rear tandem axle in a single bracket.</p> <p><b><u>STABILIZER CONTROLS</u></b></p> <p>An electrically controlled hydraulic valve shall power stabilizer movement. The valve can also be manually controlled in the event of electrical malfunction. Hydraulic power override controls shall be incorporated into the valve. The manual override mechanism shall be completely sealed within the valve assembly to prevent any possibility of corrosion.</p> <p>The stabilizer controls shall be located to provide the operator with a full view of each stabilizer being positioned. Each stabilizer control panel shall include the following:</p> <ul style="list-style-type: none"> <li>-In/out stabilizer beam control toggle switch</li> <li>-Up/down stabilizer jack control toggle switch</li> <li>-Emergency hydraulic power unit (EPU) control toggle switch</li> <li>-High idle control toggle switch</li> <li>-Stabilizer fully extended LED indicator lights</li> </ul>		

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	Yes	No
<p>-Stabilizer planted LED indicator lights</p> <p>As a safety device, an electrically actuated diverter valve shall be provided. The hydraulic power shall be diverted to the aerial ladder controls automatically the instant all stabilizer jacks are firmly planted on the ground. Once the aerial ladder is raised from the bedded position, the stabilizer hydraulic power is cut off so the stabilizers shall not accidentally be moved while the aerial is being operated.</p> <p>To aid in leveling the unit, two bubble type angle indicators shall be located near the stabilizer controls. One indicator shall show the angle of the truck from the front to rear and the other shall show the side to side angle of the truck. The indicators shall be color coded green to show when the truck has been properly leveled allowing the aerial device to be operated at full capacity.</p> <p>A stabilizer deployment audible warning alarm shall be provided at each side of the body, activated by the stabilizer movement.</p> <p>A "Stabilizers Not Stowed" indicator light shall be provided in the cab within view of the driver. It shall illuminate automatically whenever the stabilizers are not fully stowed to prevent damage to the vehicle if it is moved. The stabilizer system shall also be wired to the "Do Not Move Truck" indicator light. This light shall flash whenever the apparatus parking brake is not engaged and the stabilizers are not fully stowed.</p> <p><b><u>STABILIZER PINS</u></b></p> <p>The stabilizer jacks shall have holes for the stabilizer pins.</p> <p><b><u>STAINLESS STEEL DOORS, STABILIZER CONTROL BOX</u></b></p> <p>Vertically hinged stainless steel doors shall be provided over each stabilizer control box. The doors shall be hinged inboard.</p> <p><b><u>HYDRAULIC SYSTEM</u></b></p> <p>All hose assemblies shall be assembled and crimped by the hose manufactures certified technician. An assembly cell shall be located on the premises where the technician can perform audits of the final aerial assembly for proper fitting torque and hose routing.</p> <p>All manufacturing employees responsible for the installation of hydraulic components shall be properly trained. Training shall include: proper handling, installation, torque requirements, cleanliness and quality control procedures for hydraulic components.</p> <p>Hoses used in the aerial hydraulic system shall be of a premium quality hose with a high abrasion resistant cover. All pressure hoses shall have a working pressure of 4000 psi. and a burst pressure rating of 16,000 psi.</p> <p>The hydraulic oil shall be a premium Multi-Vis product that shall have a leading edge additive package, provide oxidation stability, be extremely shear</p>		

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Yes No

stable, and have maximum anti-wear properties. All oil delivered to the manufacturing site shall have a minimum ISO cleanliness level of 18/15/13.

Each aerial shall be evaluated as to the region and climate where it shall be used to determine the optimum viscosity and proper oil grade. Oil viscosity shall be based on an optimum range of 80 to 1000 SUS during normal aerial use. Before shipment of the unit, an oil sample shall be taken and analyzed to confirm the oil is within the allowable ISO grade tolerance.

The aerial hydraulic system shall have a minimum oil cleanliness level of ISO 18/15/13 based on the ISO 4406:1999 cleanliness standard. Each customer shall receive a certificate of actual cleanliness test results and an explanation of the rating system.

Each aerial shall include an oil sample port, identified with a yellow dust cap and a label, for subsequent customer testing.

Ball valves shall be provided in the hydraulic suction and return lines to permit component servicing without draining the oil reservoir.

The system hydraulic pressure shall be displayed on a 2.5" liquid filled gauge, located on the control console.

The hydraulic system shall be additionally protected from excessive pressure by a secondary pressure relief valve set at 3150 psi. In the event the main hydraulic pump compensator malfunctions, the secondary relief shall prevent system damage.

## HYDRAULIC CYLINDERS

All cylinders used on the aerial device shall be produced by a manufacturer that specializes in the manufacture of hydraulic cylinders.

Each cylinder shall include integral safety holding cartridges. No manifold or transfer tube mounted cartridges shall be acceptable.

Each cylinder shall be designed to a minimum safety factor of 4:1 to failure.

All safety holding cartridges shall be installed at the cylinder manufacturer, in a controlled clean environment to avoid possible contamination and or failure.

## HYDRAULIC PUMP

The hydraulic system shall be supplied by a variable displacement, load and pressure compensating piston pump. The pump shall meet the demands of all three (3) simultaneous aerial functions. The pump shall provide proper flow for a single aerial function with the engine at idle speed. A switch shall be provided on the control console to increase the engine speed for multiple function operation.

## EMERGENCY PUMP

The aerial shall be equipped with an emergency hydraulic pump, electrically driven from the truck batteries. The pump shall be capable of running for 30

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Complies

Yes No

minutes for limited aerial functions to stow the unit in case of a main pump or truck system failure. A momentary switch shall be located at the stabilizer and aerial control locations to activate the emergency pump.

## AERIAL CONTROL VALVE

The aerial hydraulic control valve shall be designed with special spool flows, limiting the oil flow for the designed function speed. The valve shall be manually controlled and be located in the control console with the handles protruding through the operating surface for operation. The activation handles shall be spaced a minimum of 3.5" for ease of operation.

## OIL RESERVOIR

The oil reservoir shall have a minimum capacity of 38 gallons. The oil fill location shall be easily accessible and be labeled "Hydraulic Oil Only" and also indicate the grade of oil that is installed in the reservoir. The fill shall have a desiccant breather filter with a water capacity of 4 fluid ounces and a 5 micron rating. A drain hose shall be included and shall terminate with a quarter turn ball valve. Two (2) suction ports shall be provided, one (1) for the main hydraulic pump and one (1) for the emergency pump. The main suction shall be slightly elevated off the bottom of the reservoir and include a 100 mesh suction strainer. The emergency suction port shall be closer to the bottom of the reservoir to provide some reserve oil for emergency operation. A six (6) disc type magnetic drain shall also be provided to collect any ferrous contaminants. A float type sending unit in the reservoir shall provide an indication of oil level on an electric gauge mounted adjacent to the fill location.

## HIGH PRESSURE FILTER

The pressure filter shall be rated for 6,000 psi working pressure and generously sized for efficiency and capacity. A 90 psi bypass spring shall be included to protect the element and hydraulic system during lower than normal system operating temperatures.

The 5Q filter element shall be constructed of a micro glass medium, which has the highest capture efficiency, dirt holding capacity and life expectancy over other media such as cellulose and synthetic. The nominal rating shall be 5 micron and have an efficiency rating of 99.3 % for 5 micron sized particles. The element shall have a dirt holding capacity of not less than 35 grams.

## RETURN FILTER

The return filter shall be rated for 800 psi working pressure and generously sized for efficiency and capacity. A 25 psi bypass spring shall be included to protect the element and hydraulic system during lower than normal system operating temperatures. The 5Q filter element shall be constructed of a micro glass medium, which has the highest capture efficiency, dirt holding capacity and life expectancy over other media such as cellulose and synthetic. The nominal rating shall be 5 microns and have an efficiency rating of 99.6% for 5

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	Yes	No
<p>micron sized particles. The element shall have a dirt holding capacity of not less than 40 grams.</p> <p><b><u>HYDRAULIC SWIVEL</u></b>  The aerial ladder shall be equipped with a three (3) port, high pressure hydraulic swivel which shall connect the hydraulic lines from the hydraulic pump and reservoir through the rotation point to the aerial control bank. The hydraulic swivel shall allow for 360 degree continuous rotation of the aerial.</p> <p><b><u>ELECTRIC SWIVEL</u></b>  The ladder shall be equipped with an electric swivel to allow 360 degrees rotation of the aerial while connecting all electrical circuits through the rotation point. A minimum of 32 collector rings shall be provided that are capable of supplying 20 amp continuous service. All collector rings shall be enclosed and protected with desiccant plugs against condensation and corrosion. No oil or silicone shall be used.</p> <p><b><u>12-BIT ABSOLUTE ENCODER</u></b>  The aerial ladder shall be equipped with a 12-Bit Absolute Encoder which provides 4096 counts per shaft turn for position and direction reference.</p> <p>The 12-Bit Absolute Encoder shall provide a unique binary word to reference each position and direction for all 360 degrees of rotation.</p> <p>If the power is interrupted for any reason, the 12-Bit Absolute Encoder shall allow power to be returned to the system without having to re-zero the settings.</p> <p>The 12-Bit Absolute Encoder shall be an integral part of a micro-processor based control system.</p> <p><b><u>ELECTRICAL SYSTEM</u></b>  The aerial electrical system shall be designed and manufactured in such a way that the power and signal protection and control compartments shall contain circuit protection devices and power control devices. The power and signal protection and control components shall be protected against corrosion, excessive heat, excessive vibration, physical damage, and water spray.</p> <p>The aerial electrical system shall be designed and manufactured to allow the following:</p> <ul style="list-style-type: none"> <li>- All of the serviceable components shall be readily accessible.</li> <li>- Circuit protection devices shall be utilized to protect each circuit.</li> <li>- All circuit protection devices shall be sized to prevent wire and component damage when subjected to extreme current overload.</li> <li>- General protection circuit breakers shall be Type-I automatic reset (continuously resetting) or Type-II (manual resetting) and conform to</li> </ul>		

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	Yes	No
<p>SAE requirements. When required, automotive type fuses conforming to SAE requirements shall be utilized to protect electronic equipment.</p> <ul style="list-style-type: none"> <li>- Power control relays and solenoids, when utilized, shall have a direct current (dc) rating of 125% of the maximum current for which the circuit is protected.</li> </ul> <p>The aerial electrical system shall be designed and manufactured to allow the following:</p> <ul style="list-style-type: none"> <li>- Toggle switches shall be utilized that are certified for the outside conditions that fire apparatus experience. (no exception)</li> <li>- All wiring shall be protected through conduit or loom.</li> <li>- All wiring harnesses shall be properly supported to eliminate harness damage through rubbing.</li> <li>- An inductive proximity switch and illumination light shall be incorporated into the boom support.</li> <li>- The aerial master and aerial PTO can be engaged after the water pump has been engaged without having to bring the RPM back to idle.</li> <li>- Standard cabling to the tip of the aerial shall consist of one (1) 16/20 cable and one (1) 12/8 cable.</li> </ul> <p><b><u>DRIVER SIDE TORQUE BOX POWER DISTRIBUTION PANEL</u></b>  A fuse and relay panel, located behind the driver side stabilizer, shall include the following:</p> <ul style="list-style-type: none"> <li>- NEMA 4x rated weatherproof enclosure</li> <li>- Relays, fuses, and circuit breakers for aerial and stabilizer interlocks and control switches</li> </ul> <p><b><u>TURNTABLE LIGHTING</u></b>  The turntable shall be lighted for nighttime operation with a minimum of two (2) work lights activated by the aerial master switch. A foot switch shall be located at the turntable console to allow hydraulic flow to the aerial device. The foot switch shall be protected by a cover to prevent accidental activation. Activation of the foot switch is necessary for aerial device operation.</p> <p><b><u>TURNTABLE CONSOLE</u></b>  The following switches and indicator lights shall be standard on the turntable console:</p> <ul style="list-style-type: none"> <li>- High idle on/off switch</li> <li>- Tip/Tracking light switch</li> <li>- Indicator and alarm test switch</li> </ul>		

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	Yes	No
<ul style="list-style-type: none"> <li>- Emergency hydraulic power switch</li> <li>- STABILIZERS NOT FULLY EXTENDED amber indicator light</li> <li>- Rung alignment green indicator light</li> </ul> <p>The turntable console shall be lighted for nighttime operation with one (1) work light activated by the aerial master switch. A fuse panel shall be located in the turntable console.</p> <p><b><u>TURNTABLE OVERRIDE CONTROLS</u></b> The aerial manual override controls shall be located in the turntable control console.</p> <p><b><u>MASTER OVERRIDE CONTROLS</u></b> An emergency power switch shall be located at the rear of the apparatus. The switch shall activate the emergency power unit and allow control of the aerial or stabilizers based on the direction the switch is toggled.</p> <p>A work light shall be provided to illuminate the master override controls when the battery switch is active and the master override door is open.</p> <p><b><u>BOOM SUPPORT</u></b> A Turck inductive proximity switch shall be provided on the boom support to detect if the aerial device is fully stowed within the boom support.</p> <p><b><u>STABILIZER INDICATOR</u></b> A "Stabilizers Not Stowed" indicator shall be provided in the driver's compartment. It shall illuminate automatically whenever the stabilizers are not fully stowed, to prevent damage to the apparatus if moved. The stabilizer system shall also be wired to the "Do Not Move" indicator light, which shall flash whenever the apparatus parking brake is not fully engaged and the stabilizers are not fully stowed.</p> <p><b><u>CRADLE INTERLOCK SYSTEM</u></b> A cradle interlock system shall be provided to prevent the lifting of the aerial from the nested position until the operator has positioned all the stabilizers in a load supporting configuration. A switch shall be installed at the cradle to prevent operation of the stabilizers once the aerial has been elevated from the nested position.</p> <p><b><u>STABILIZER ALARM</u></b> An electronic warning device shall be provided at each stabilizer to warn personnel that the stabilizers are being deployed. Each alarm shall produce a fast pulsing 90 DBA signal and shall cancel only when the stabilizer is put into a load bearing configuration.</p>		

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Complies

Yes No

## STABILIZER SCENE LIGHTS

A 4.00" clear floodlight shall be provided on each stabilizer to illuminate the surrounding area. The light shall be actuated by the aerial master switch.

## SPOTLIGHTS

Four (4) Collins, model FX-12, 750,000 candle power, 12-volt spot/floodlights shall be furnished. The two (2) "tracking lights" shall be mounted on the base section of the ladder, one (1) each side. The two (2) "tip lights" shall be mounted on the tip of the ladder, one (1) on each side. The lights shall be mounted below the handrail height so as not to increase the overall height of the unit. An individual master switch with appropriate identification labels shall be provided for the "tracking lights" and "tip lights" in addition to the on/off switch located on the light itself.

## AERIAL LOCATOR LIGHTS, STROBE

Two (2) lights shall be installed, one (1) each side at the aerial tip for the purpose of locating the aerial device while in operation. The lights shall be Whelen, Model 800D, strobe beacons with Whelen BGL branch guards. The lights shall be activated whenever the aerial device is raised from the cradle. The color of the locator lights shall be clear.

## STABILIZER WARNING LIGHTS

Four (4) Whelen, Model M6\* LED flashing warning lights with bezels shall be installed, one (1) on each stabilizer cover panel.

The front stabilizer pan light shall be red.

The rear stabilizer pan light shall be red.

Each light shall include a lens that is the same color as the LED's.

These warning lights shall be activated by the same switch as the side warning lights.

## STABILIZER BEAM WARNING LIGHTS

Two (2) 4.00" diameter red LED flashing lights shall be mounted on each stabilizer, one (1) facing forward and one (1) facing rearward.

The lights shall be Grote Supernova 40 series LED lights.

The lights shall be recessed in the horizontal beam of the stabilizer.

These warning lights shall be activated with the aerial master switch.

## 120-VOLT RECEPTACLE AT TIP

A 120-volt, 20 amp, three (3)-prong twist lock receptacle, with weatherproof cover shall be provided at the tip of the aerial device.

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	Yes	No
<p><b><u>COMMUNICATION SYSTEM</u></b>  An Atkinson communication system shall be furnished between the aerial tip and the turntable operator's position. The communication system shall be a two (2)-way system with the communication speaker at the tip requiring no operator attention to transmit or receive. The transmitting and receiving volume controls shall be located at the turntable operator's position.</p> <p><b><u>LIFTING EYE - ROPE RESCUE ATTACHMENT</u></b>  Two (2) eyes shall be welded, one (1) to each ladder beam, at the ladder egress with a spreader bar to mounted between the eyes. This design shall distribute a load evenly across the ladder beams because of a single lifting eye on the spreader bar. The bar is retained by two (2) locking pins, one (1) at each end outboard of each eye. Leveling is maintained by the bar rotating in the eyes.</p> <p><b><u>COLLISION AVOIDANCE</u></b>  The aerial device shall be supplied with a collision avoidance control system. The collision avoidance control system shall be calibrated so that the aerial device does not make contact with any part of the fire apparatus during normal operation. The collision avoidance control system shall consist of the following sensors:</p> <ul style="list-style-type: none"> <li>Single axis sensor to determine aerial device elevation.</li> <li>Angle sensors to determine turntable angle with reference to aerial device position.</li> <li>Absolute encoder integral to the swivel to determine aerial device rotation.</li> </ul> <p>The aerial ladder shall be equipped with an absolute encoder for position and direction reference.</p> <p>The absolute encoder shall provide a unique binary word to reference each position and direction for all 360 degrees of rotation.</p> <p>If the power is interrupted for any reason, the absolute encoder shall allow power to be returned to the system without having to re-zero the settings.</p> <p>The absolute encoder shall be an integral part of a microprocessor based control system</p> <p>The collision avoidance control system shall be divided up to a maximum of nine (9) control zones. Each zone shall have its own independent rotation and elevation parameters.</p> <p>The collision avoidance control system shall be equipped with a warning system that alerts the operator when the aerial device has reached the limits of each control zone. The warning system shall sound when either the rotation or elevation movements reach the limits of the control zone.</p>		

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	Yes	No
<p>The warning system alarm and red light shall be active whenever the ladder is in a restricted area and shall then prevent aerial device movement.</p> <p>A green indicator light shall activate when the aerial is in a position to be safely stowed.</p> <p><b><u>COMMAND ZONE WARRANTY</u></b></p> <p>The Command Zone components shall be warranted against defective materials or workmanship for a period of <b>five (5) years</b> from the date of delivery to the original purchaser. The warranty shall also include a standard repair time for covered components.</p> <p>A copy of the fire apparatus manufacturer's warranty shall be included with the bid.</p> <p><b><u>STABILIZER SCENE LIGHTS</u></b></p> <p>One (1) Trucklite, Model 44042C LED, scene light shall be installed on each stabilizer to illuminate the surrounding area. These lights shall be installed in place of the standard lights. A total of four (4) lights shall be installed.</p> <p><b><u>MANSAVER™ BARS, AERIAL TURNTABLE</u></b></p> <p>ManSaver™ bars shall be installed at the aerial turntable.</p> <p><b><u>WATER SYSTEM</u></b></p> <p>A waterway system shall be provided consisting of the following components and features:</p> <p>A 5.00" pipe connected to the water supply on one end and to a water swivel at the rotation point of the turntable. The water swivel shall allow the ladder to rotate 360 degrees continuously while flowing water.</p> <p>A 4.00" waterway swivel is to be routed through the rotation point swivel up to the heel pin swivel. The heel pin swivel shall allow the water to flow to the ladder pipe while elevating the aerial ladder from -5 degrees to 75 degrees. The heel pivot pin is not integral with the waterway swivel at any point. The design of the waterway shall allow complete servicing of the waterway swivel without disturbing the heel pivot pin.</p> <p>The integral telescopic water system shall consist of a 4.50" diameter tube in the base section, a 4.00" diameter tube in the inner mid-section, 3.50" diameter tube in the outer mid-section and a 3.00" diameter tube in the fly section. The telescopic water pipes shall be anodized aluminum.</p> <p>The rotational torque shall have adequate power to rotate the ladder into a full 1000 gallon per minute water stream directed at 90 degrees to the side while maintaining the fully rated tip load.</p> <p>The aerial shall be capable of discharging up to 1000 gallons per minute at 100 pounds per square inch parallel to the ladder and 90 degrees to each side of center while maintaining the fully rated tip load.</p>		

<b>Cambridge Fire Department Apparatus Specification</b>	Bidder Complies	
	Yes	No
<p>An adjustable intake relief valve shall be furnished to protect the aerial waterway from a pressure surge.</p> <p>A 1.50" drain valve shall be located at the lowest point of the waterway system.</p> <p><b><u>WATERWAY SEALS</u></b></p> <p>The waterway seals shall be of type-B PolyPak design, composed of nitroxile seal and a nitrile wiper, which together offer maximum stability and extrusion resistance on the waterway. The seal shall be capable of withstanding pressures up to 2000 psi, temperatures in excess of 250 degrees Fahrenheit and have resistance to all foam generating solutions. The seals shall be internally lubricated.</p> <p>The waterway seals shall have automatic centering guides constructed of synthetic thermalpolymer. The guides shall provide positive centering of the extendible sections within each other and the base section to insure longer service life and smoother operation.</p> <p><b><u>AERIAL MONITOR</u></b></p> <p>An Akron, model 3578 monitor with stow and deploy shall be provided at the tip with a Akron 1250 gpm Model 1577.</p> <p>The monitor's functions shall be controlled electrically from two (2) separate locations. One (1) control shall be located at the control console and the other at the ladder tip.</p> <p>There shall be a courtesy light at the tip of the aerial to illuminate the controls.</p> <p><b><u>FLOW METER (Aerial Waterway)</u></b></p> <p>A Fire Research Corporation (FRC), Model DF430, digital flow indicator with a four (4) digit LED display shall be provided for the aerial waterway at the turntable control station.</p> <p>The display shall have a flow totalizer, programmable high and low flow warnings, and automatically adjust LED brightness for day/night viewing.</p> <p><b><u>REAR INLET</u></b></p> <p>A 5.00" NST inlet to the aerial waterway shall be provided at the rear of the apparatus. It shall be furnished with a 5.00" chrome plated adapter and a 5.00" chrome plated, long handle cap.</p> <p><b><u>WATERWAY LOCKING SYSTEM</u></b></p> <p>The aerial ladder waterway monitor shall be capable of being positioned at either the fly section or at the next lower section of the ladder.</p> <p>The monitor location shall be changeable by the use of a single handle, located at the side of the ladder.</p> <p>The handle, attached to a cam bracket, shall simply be moved forward to lock the monitor at the fly section and back to lock it to the previous section.</p>		

Cambridge Fire Department Apparatus Specification	Bidder Complies	
	Yes	No
<p>There shall be no pins to remove and reinstall.</p> <p>The monitor shall be operational at all times, regardless of its position, without connecting or disconnecting electrical lines.</p> <p><b><u>QUICKLOCK WATERWAY LOCK</u></b>  <b>There shall be a bracket provided below the handle for the quick lock waterway with a pin and retaining cable to secure the handle in the desired position.</b></p> <p><b><u>TOOLS</u></b>  The following tools shall be provided for retorquing of all specified bolts as recommended by the manufacturer:</p> <ul style="list-style-type: none"> <li>- Torque Wrench</li> <li>- All Required Extensions, Sockets and Adapters</li> <li>- 4-to-1 Multiplier</li> </ul> <p><b><u>MANUALS</u></b>  Two (2) operator maintenance manuals and two (2) wiring diagrams pertaining to the aerial device shall be provided with the apparatus at time of pick-up.</p>		

Cambridge Fire Department Apparatus Specification	Bidder Complies	
	Yes	No
<p><b><u>LOOSE EQUIPMENT</u></b></p> <p>The following equipment shall be furnished with the completed unit:</p> <ul style="list-style-type: none"> <li>- Four (4) bags of chrome, stainless steel, or cadmium plated screws, nuts, bolts and washers, as used in the construction of the unit</li> <li>- one (1) (2.50 gallon pressurized water</li> <li>- one (1) 15 pound, CO2</li> <li>- one (1) Ansul, Model I-A-20-G, 20 lb, FORAY dry chemical</li> </ul> <p>The pressurized water extinguisher must be able to be filled in the field with the use of specialized equipment.</p> <ul style="list-style-type: none"> <li>- Two (2) Flathead Axes: Fiberglass handles and blade shields</li> <li>- Three (3) Pickhead Axes: Fiberglass handles and pick covers</li> </ul> <p><b><u>NFPA REQUIRED LOOSE EQUIPMENT, PROVIDED BY FIRE DEPARTMENT</u></b></p> <p>The following loose equipment as outlined in NFPA 1901, 2009 edition, section 8.8.2 shall be provided by the fire department. All loose equipment shall be installed on the apparatus before placed in emergency service, unless the fire department waives NFPA section 4.21.</p> <ul style="list-style-type: none"> <li>• Two (2) 3 ft - 4 ft plaster hooks with D handles mounted in brackets fastened to the apparatus.</li> <li>• Two (2) crowbars mounted in brackets fastened to the apparatus.</li> <li>• Two (2) claw tools mounted in brackets fastened to the apparatus.</li> <li>• Two (2) 12 lb (5 kg) sledgehammers mounted in brackets fastened to the apparatus.</li> <li>• One (1) SCBA complying with NFPA 1981, <i>Standard on Open-Circuit Self-Contained Breathing Apparatus for Fire and Emergency Services</i>, for each assigned seating position, but not fewer than four (4), mounted in brackets fastened to the apparatus or stored in containers supplied by the SCBA manufacturer.</li> <li>• One (1) spare SCBA cylinder for each SCBA carried, each mounted in a bracket fastened to the apparatus or stored in a specially designed storage space(s).</li> <li>• One (1) first aid kit.</li> </ul>		

Cambridge Fire Department Apparatus Specification	Bidder Complies	
	Yes	No
<ul style="list-style-type: none"> <li>• Six (6) salvage covers, each a minimum size of 12 ft × 18 ft (3.6 m × 5.5 m).</li> <li>• Four (4) combination spanner wrenches mounted in brackets fastened to the apparatus.</li> <li>• Two (2) scoop shovels mounted in brackets fastened to the apparatus.</li> <li>• One (1) pair of bolt cutters, 24" (0.6 m) minimum, mounted in a bracket fastened to the apparatus.</li> <li>• Four (4) ladder belts meeting the requirements of NFPA 1983, <i>Standard on Fire Service Life Safety Rope and System Components</i>.</li> <li>• One (1) 150 ft (45 m) light-use life safety rope meeting the requirements of NFPA 1983, <i>Standard on Fire Service Life Safety Rope and System Components</i>.</li> <li>• One (1) 150 ft (45 m) general-use life safety rope meeting the requirements of NFPA 1983, <i>Standard on Fire Service Life Safety Rope and System Components</i>.</li> <li>• Two (2) 150 ft (45 m) utility ropes having a breaking strength of at least 5000 lb (2300 kg).</li> <li>• One (1) box of tools to include the following: <ul style="list-style-type: none"> <li>- one (1) hacksaw with three (3) blades</li> <li>- one (1) keyhole saw</li> <li>- one (1) 12" (.3 m) pipe wrench</li> <li>- one (1) 24" (.6 m) pipe wrench</li> <li>- one (1) ballpeen hammer</li> <li>- one (1) pair of tin snips</li> <li>- one (1) pair of pliers</li> <li>- one (1) pair of lineman's pliers</li> <li>- assorted types and sizes of screwdrivers</li> <li>- assorted adjustable wrenches</li> <li>- assorted combination wrenches</li> </ul> </li> <li>• One (1) traffic vest for each seating position, each vest to comply with ANSI/ISEA 207, <i>Standard for High Visibility Public Safety Vests</i>, and have a five-point breakaway feature that includes two (2) at the shoulders, two (2) at the sides, and one (1) at the front.</li> </ul>		

# Cambridge Fire Department Apparatus Specification

Bidder  
Complies

Yes No

- Five (5) fluorescent orange traffic cones not less than 28.00" (711 mm) in height, each equipped with a 6.00" (152 mm) retro-reflective white band no more than 4.00" (102 mm) from the top of the cone, and an additional 4.00" (102 mm) retro-reflective white band 2.00" (51 mm) below the 6.00" (152 mm) band.
- Five (5) illuminated warning devices such as highway flares, unless the five (5) fluorescent orange traffic cones have illuminating capabilities.
- One (1) automatic external defibrillator (AED).
- One (1) double female 2.50" adapter with National Hose Threads, mounted in a bracket fastened to the apparatus (if equipped with a fire pump).
- One (1) double male 2.50" adapter with National Hose Threads, mounted in a bracket fastened to the apparatus (if equipped with a fire pump).
- One (1) rubber mallet, for use on suction hose connections, mounted in a bracket fastened to the apparatus (if equipped with a fire pump).
- Two (2) hydrant wrenches mounted in brackets fastened to the apparatus (if equipped with a fire pump).
- If the supply hose carried does not use sexless couplings, an additional double female adapter and double male adapter, sized to fit the supply hose carried, shall be carried mounted in brackets fastened to the apparatus (if equipped with a fire pump).
- If none of the pump intakes are valved, a hose appliance that is equipped with one or more gated intakes with female swivel connection(s) compatible with the supply hose used on one side and a swivel connection with pump intake threads on the other side shall be carried. Any intake connection larger than 3.00" (75 mm) shall include a pressure relief device that meets the requirements of 16.6.6 (if equipped with a fire pump).
- If the apparatus does not have a 2.50" National Hose (NH) intake, an adapter from 2.50" 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 (if equipped with a fire pump).
- If the supply hose carried has other than 2.50" National Hose (NH) threads, adapters shall be carried to allow feeding the supply hose from a 2.50" NH thread male discharge and to allow the hose to connect to a 2.50" NH female intake, mounted in brackets fastened to the apparatus if not already mounted directly to the discharge or intake (if equipped with a fire pump).

# Cambridge Fire Department Apparatus Specification

Bidder  
Complies

Yes No

## DRY CHEMICAL EXTINGUISHER PROVIDED BY FIRE DEPARTMENT

NFPA 1901, 2009 edition, section 8.8.2 requires one (1) approved dry chemical portable fire extinguisher with a minimum 80-B:C rating mounted in a bracket fastened to the apparatus.

The extinguisher is not on the apparatus as manufactured. The fire department shall provide and mount the extinguisher.

## WATER EXTINGUISHER PROVIDED BY FIRE DEPARTMENT

NFPA 1901, 2009 edition, section 8.8.2 requires one (1) 2.5 gallon or larger water extinguisher mounted in a bracket fastened to the apparatus.

The extinguisher is not on the apparatus as manufactured. The fire department shall provide and mount the extinguisher.

Cambridge Fire Department Apparatus Specification	Bidder Complies	
	Yes	No
<p><b><u>PAINT</u></b></p> <p>The exterior custom cab and body painting procedure shall consist of a seven (7) step finishing process as follows:</p> <ol style="list-style-type: none"> <li>1. <u>Manual Surface Preparation</u> - All exposed metal surfaces on the custom cab and body shall be thoroughly cleaned and prepared for painting. Surfaces that shall not be painted include all chrome plated, polished stainless steel, anodized aluminum and bright aluminum treadplate. Each imperfection on the exterior metal surface shall be removed or filled and then sanded smooth for a smooth appearance. All seams shall be sealed before painting.</li> <li>2. <u>Chemical Cleaning and Treatment</u> - The metal surfaces shall be properly cleaned using a high pressure and high temperature cleaning system. Surfaces are chemically cleaned to remove all dirt, oil, grease and metal oxides to ensure the subsequent coatings bond well. An ultra pure water final rinse shall be applied to all metal surfaces at the conclusion of the metal treatment process.</li> <li>3. <u>Primer/Surfacer Coats</u> - A two (2) component urethane primer/surfacer shall be hand applied to the chemically treated metal surfaces to provide a strong corrosion protective base coat and to smooth out the surface.</li> <li>4. <u>Hand Sanding</u> - The primer/surfacer coat shall be lightly sanded to an ultra smooth finish.</li> <li>5. <u>Sealer Primer Coat</u> - A two (2) component sealer primer coat shall be applied over the sanded primer.</li> <li>6. <u>Topcoat Paint</u> - Urethane base coat shall be applied to opacity for correct color matching.</li> <li>7. <b><u>Clearcoat</u></b> - Two (2) coats of an automotive grade two (2) component urethane shall be applied. Lap style doors shall be clear coated to match the body. Roll-up doors shall not be clear coated and the standard roll-up door warranty shall apply.</li> </ol> <p>All removable items such as brackets, compartment doors, door hinges, trim, etc. shall be removed and painted separately to insure paint behind all mounted items. Body assemblies that cannot be finish painted after assembly shall be finish painted before assembly.</p> <p><b>The cab shall be two-tone, with the upper section painted white and lower section of the cab and body painted red so as to match the current Cambridge Apparatus.</b></p> <p><b><u>PAINT - ENVIRONMENTAL IMPACT</u></b></p> <p>Contractor shall meet or exceed all current State (his) regulations concerning paint operations. Pollution control shall include measures to protect the atmosphere, water and soil. Controls shall include the following conditions:</p> <ul style="list-style-type: none"> <li>- Topcoats and primers must be chrome and lead free.</li> </ul>		

Cambridge Fire Department Apparatus Specification	Bidder Complies	
	Yes	No
<ul style="list-style-type: none"> <li>- Metal treatment chemicals must be chrome free. The wastewater generated in the metal treatment process must be treated on-site to remove any other heavy metals.</li> <li>- Particulate emission collection from sanding operations must have a 99.99% efficiency factor.</li> <li>- Particulate emissions from painting operations must be collected by a dry filter or water wash process. If the dry filter means is used, it must have an efficiency rating of 98.00%. Water wash systems must be 99.97% efficient.</li> <li>- Water from water wash booths must be reused. Solids shall be removed mechanically on a continual basis to keep the water clean.</li> <li>- Paint wastes are disposed of in an environmentally safe manner. They are used as fuel in kilns used in the cement manufacturing process - thereby extracting energy from a waste material.</li> <li>- Empty metal paint containers must be cleaned, crushed and recycled to recover the metal.</li> <li>- Solvents used in cleanup operations must be collected, recycled on-site, or sent off-site for distillation and returned for reuse. Residue from the distillation operation shall be used as fuel in off-site cement kilns.</li> </ul> <p>Additionally, the finished apparatus shall not be manufactured with or contain products that have ozone depleting substances. Contractor shall, upon demand, present evidence that his manufacturing facility meets the above conditions and that it is in compliance with his State EPA rules and regulations.</p> <p><b><u>PAIN CHASSIS FRAME ASSEMBLY</u></b>  The chassis frame assembly shall be painted red before the installation of the cab and body, and before installation of the engine, drive shafts and transmission assembly, air brake lines, electrical wire harnesses, etc. Components that are included with the chassis frame assembly that shall be painted red are frame rails, cross members, axles, suspension, steering gear, fuel tank, body substructure supports, miscellaneous mounting brackets, etc.</p> <p><b><u>PAIN, FRONT WHEELS</u></b>  All wheel surfaces, inside and outside, shall be provided with powder coat paint #106 red.</p> <p><b><u>PAIN, REAR WHEELS</u></b>  All wheel surfaces, inside and outside, shall be provided with powder coat paint #106 red.</p> <p><b><u>AERIAL EGRESS PAINT COLOR</u></b>  The tip of the aerial device shall be painted #381 lime green.</p>		

# Cambridge Fire Department Apparatus Specification

Bidder  
Complies

Yes No

## PAINT, COMPARTMENT INTERIOR

Interior of compartmentation shall be painted with a gray spatter type paint.

## AERIAL DEVICE PAINT COLOR

The aerial device paint procedure shall consist of a six (6) step finishing process as follows:

1. Manual Surface Preparation - All exposed metal surfaces on the aerial device structural components above the rotation point shall be thoroughly cleaned and mechanically shot-blasted to remove metal impurities and prepare the aerial for painting.
2. Primer/Surfacer Coats - A two (2) component urethane primer/surfacer shall be hand applied to the chemically treated metal surfaces to provide a strong corrosion protective base coat and to smooth out the surface. All seams shall be caulked before painting.
3. Hand Sanding - The primer/surfacer coat shall be lightly sanded to an ultra smooth finish.
4. Sealer Primer Coat - A two (2) component sealer primer coat shall be applied over the sanded primer.
5. Topcoat Paint - Urethane base coat shall be applied to opacity for correct color matching.
6. Clearcoat - Two (2) coats of an automotive grade two (2) component urethane shall be applied.

Surfaces that shall not be painted include all chrome plated, polished stainless steel, anodized aluminum and bright aluminum treadplate.

All buy out components, such as monitor, nozzle, gauges, etc. shall be supplied as received from the vendor.

Removable items such as brackets shall be removed and painted separately to ensure paint coverage behind all mounted items.

The aerial device (turntable and ladder sections) shall be painted white 20 using the six (6) step finishing process.

The support structure, rotation motor, components below the rotation point and the stabilizers shall be cleaned, caulked, primed and painted job color.

The tip of the ladder shall be painted a contrasting color for high visibility.

## REFLECTIVE BAND

A 10.00" white reflective band shall be provided across the front of the vehicle and along the sides of the body.

The reflective band provided on the cab face shall be at the headlight level.

Cambridge Fire Department Apparatus Specification	Bidder Complies	
	Yes	No
<p><b><u>CHEVRON STRIPING, REAR</u></b>  There shall be alternating chevron striping located on the rear-facing vertical surface of the apparatus. Covered surfaces shall include the rear wall and aluminum doors. Rear compartment doors, stainless steel access doors, and the rear bumper shall not be covered.</p> <p>The colors shall be red and fluorescent yellow green diamond grade.</p> <p>Each stripe shall be 6.00" in width.</p> <p>This shall meet the requirements of NFPA 1901, 2009 edition, which states that 50% of the rear surface shall be covered with chevron striping.</p> <p><b><u>REFLECTIVE STRIPE ON STABILIZERS</u></b>  There shall be a 4.00" wide fluorescent yellow green diamond grade reflective stripe provided on the forward and rear facing side of all aerial stabilizers.</p> <p><b><u>STOP SIGN, REFLECTIVE, CAB DOORS</u></b>  A 12.00" x 12.00" reflective stop sign shall be provided on the interior of each cab door. The stop sign shall be located on the stainless steel door panel.</p> <p>This sign shall meet the NFPA 1901 requirement.</p> <p><b><u>BODY STRIPE</u></b>  There shall be a genuine gold leaf stripe around the top, bottom, front and rear edges of the body compartments with scrolls in each corner.</p> <p><b><u>BODY STRIPE</u></b>  There shall be a genuine gold leaf stripe provided on each side of the body, located along the top of the side compartmentation.</p> <p><b><u>BODY STRIPE</u></b>  There shall be a genuine gold leaf stripe provided on each side of the body, located along the bottom of the compartment doors.</p> <p><b><u>LETTERING</u></b>  The lettering shall be totally encapsulated between two (2) layers of clear vinyl.</p> <p><b><u>LETTERING</u></b>  Forty-one (41) to sixty (60) genuine gold leaf lettering, 3.00" high, with outline and double shade shall be provided.</p> <p><b><u>LETTERING</u></b>  There shall be genuine gold leaf lettering, 5.00" high, with outline and shade provided. There shall be two (2) letters provided.</p>		

Cambridge Fire Department Apparatus Specification	Bidder Complies	
	Yes	No
<p><b><u>LETTERING</u></b> There shall be non-reflective vinyl lettering, 2.00" high, with no outline or shade provided. There shall be seven (7) letters provided.</p>		
<p><b><u>LETTERING</u></b> One (1) to twenty (20) reflective lettering, 3.00" high, with no outline or shade shall be provided.</p>		
<p><b><u>LETTERING</u></b> There shall be reflective lettering, 16.00" high, with no outline or shade provided. There shall be two (2) letters provided.</p>		
<p><b><u>LETTERING</u></b> Twenty-one (21) to forty (40) genuine gold leaf lettering, 3.00" high, with outline and double shade shall be provided.</p>		
<p><b><u>REFLECTIVE LETTERING, "DIAL 911" INSET</u></b> There shall be ruby red, "inset", reflective lettering installed on a roll-up door which reads "DIAL 911". The striping line shall stop, "DIAL 911" shall be placed in the break and the stripe shall again continue. "DIAL" shall be vertical and as tall as the stripe. "911" shall be horizontal and as tall as the stripe. There shall be two (2) sets located the body doors.</p>		
<p><b><u>KEEP BACK SIGN</u></b> A "KEEP BACK 300 FEET" sign shall be mounted at the rear of the apparatus. It shall have white reflective lettering with a red background.</p>		
<p><b><u>DECAL INSTALLATION</u></b> There shall be one (1) pair of decals furnished by the fire department and applied by the apparatus manufacturer.</p>		
<p><b><u>EMBLEM, FLEUR DE LIS</u></b> There shall be one (1) pair of fleur de lis emblems, comprised of genuine gold leaf material, provided and installed cab corner.</p>		
<p><b><u>RUST PROOFING, CHASSIS FRAME ASSEMBLY</u></b> The apparatus frame shall be properly treated by an authorized Ziebart dealer.  The rust proofing material shall be a black coating of an organic based corrosion inhibitor for long term protection against corrosion.  The rust proofing material utilized shall be formulated to resist corrosion.  Coating texture shall be waxy and pliable after drying so it shall not chip, crack, or peel off during normal vehicle operations. Minimum dry film thickness shall be in the range of 3.00 to 4.00 mils.  The material shall be applied to the following areas:</p>		

Cambridge Fire Department Apparatus Specification	Bidder Complies	
	Yes	No
<p>Inside of chassis frame rails and crossmembers: chassis assembly process</p> <p>After normal chassis assemble is complete at the chassis assembly area, the nearest Ziebart dealer shall apply a penetrant and rust proofing to the inside of the frame rails, and crossmembers.</p> <p>All harnesses, airlines, etc. shall be properly masked wherever possible.</p> <p>Components shall be pulled out of the way to provide access to the inside of the frame rails and crossmembers to achieve adequate coverage of the rust proofing material.</p> <p>Outside of chassis frame rails: assembly plant process</p> <p>After all body mounting angles, and tank cradle mounts are installed onto the chassis frame assemble, the nearest Ziebart dealer shall apply a penetrant and rust proofing.</p> <p>The process shall cover the complete outside, top flange, and bottom flange of frame sealing all the joints between body mount angles and frame.</p> <p><b><u>RUST PROOF, TORQUE BOX</u></b></p> <p>A coating shall be applied to the bottom and the two (2) sides of the torque box. The coating texture shall be waxy and pliable after drying so it shall not chip, crack, or peel off during normal vehicle operations.</p> <p>The rust proofing material shall be black, and is a coating of a corrosion inhibitor for long-term protection against corrosion.</p> <p><b><u>RUSTPROOFING/UNDERCOATING</u></b></p> <p>The apparatus cab shall be properly treated by an authorized Ziebart dealer.</p> <p>The rust proofing material shall be a transparent coating of an organic based corrosion inhibitor for long-term protection against corrosion.</p> <p>The rust proofing material utilized shall be formulated to resist corrosion.</p> <p>Coating texture shall be waxy and pliable after drying so it shall not chip, crack, or peel off during normal vehicle operations. Minimum dry film thickness shall be in the range of 3.00 to 4.00 mils.</p> <p>The material shall be applied to the following areas:</p> <ul style="list-style-type: none"> <li>Interior of the cab doors.</li> <li>Interior of all double panel style body doors.</li> </ul> <p>The underside of the apparatus shall be undercoated with an asphalt petroleum based material, dark in color.</p>		

Cambridge Fire Department Apparatus Specification	Bidder Complies	
	Yes	No
<p>The undercoating material utilized on the apparatus shall be formulated to resist corrosion and deaden unwanted sound or road noise.</p> <p>Coating texture shall appear firm, flexible, and resistant to abrasion. Minimum dry film thickness shall be in the range of 8.00 to 12.00 mils.</p> <p>The material shall be applied to the following areas:</p> <ul style="list-style-type: none"> <li>Body and cab wheel well fender liners, on the back side only.</li> <li>Underside of body and cab sheet metal, and structural components.</li> <li>Underside and vertical sides of all sheet metal compartmentation, including support angles.</li> <li>Structural support members under running boards, rear platforms, battery boxes, walkways, etc.</li> <li>Inside surfaces of the pump heat enclosure, (when installed).</li> </ul>		

### City of Cambridge CORI Policy

1. Where Criminal Offender Record Information (CORI) checks are part of a general background check for employment or volunteer work, the following practices and procedures will generally be followed.
2. CORI checks will only be conducted as authorized by Criminal History Systems Board (CHSB). All applicants will be notified that a CORI check will be conducted. If requested, the applicant will be provided with a copy of the CORI policy.
3. An informed review of a criminal record requires adequate training. Accordingly, all personnel authorized to review CORI in the decision-making process will be thoroughly familiar with the educational materials made available by the CHSB.
4. Prior to initiating a CORI check, the City will review the qualifications of the applicant to determine if the applicant is otherwise qualified for the relevant position. The City will not conduct a CORI check on an applicant that is not otherwise qualified for the relevant position.
5. Unless otherwise provided by law, a criminal record will not automatically disqualify an applicant. Rather, determination of suitability based on CORI checks will be made consistent with this policy and any applicable law or regulations.
6. If a criminal record is received from CHSB, the authorized individual will closely compare the record provided by CHSB with the information on the CORI request form and any other identifying information provided by the applicant, to ensure the record relates to the applicant.
7. If, in receiving a CORI report, the City receives information it is not authorized to receive (e.g. cases with dispositions such as not guilty or dismissal, in circumstances where the City is only authorized to receive convictions or case-pending information), the City will inform the applicant and provide the applicant with a copy of the report and a copy of CHSB's *Information Concerning the Process in Correcting a Criminal Record* so that the applicant may pursue correction with the CHSB.
8. If the City of Cambridge is planning to make an adverse decision based on the results of the CORI check, the applicant will be notified immediately. The applicant shall be provided with a copy of the criminal record and the City's CORI policy, advised of the part(s) of the record that make the individual unsuitable for the position and given an opportunity to dispute the accuracy and relevance of the CORI record.
9. Applicants challenging the accuracy of the criminal record shall be provided a copy of CHSB's *Information Concerning the Process in Correcting a Criminal Record*. If the CORI record provided does not exactly match the identification information provided by the applicant, the City of Cambridge will make a determination based on a comparison of the CORI record and documents provided by the applicant. The City of Cambridge may contact CHSB and request a detailed search consistent with CHSB policy.
10. If the City of Cambridge reasonably believes the record belongs to the applicant and is accurate, then the determination of suitability for the position will be made. Unless otherwise provided by law, factors considered in determining suitability may include, but not be limited to the following:
  - (a) Relevance of the crime to the position sought;
  - (b) The nature of the work to be performed;
  - (c) Time since the conviction;
  - (d) Age of the candidate at the time of offense;
  - (e) Seriousness and specific circumstances of the offense;
  - (f) The number of offenses;
  - (g) Whether the applicant has pending charges;
  - (h) Any relevant evidence of rehabilitation or lack thereof;
  - (i) Any other relevant information, including information submitted by the candidate or requested by the City.
11. The Personnel Department will assist affected departments, in assessing the suitability of candidates in accordance with paragraph 10 a through i above, to ensure consistency, fairness, and protection of employment opportunities

Name of Bidder: \_\_\_\_\_

File No 5906 To Furnish and Deliver Qty of One (1) new. Custom Built 105' Heavy Duty Aerial Ladder  
Thursday, September 27, 2012 @ 11:00 AM  
and the public interest.

12. The City of Cambridge will notify the applicant of the decision and the basis of the decision in a timely manner.
13. CORI information shall not be disseminated or shared with any unauthorized employees or other, but shall be maintained in confidence consistent with the obligations of law.

Revised May 5, 2007

Name of Bidder: \_\_\_\_\_

**ORDINANCE NUMBER 1312**

**Final Publication Number 3155. First Publication in the Chronicle on December 13, 2007.**

**City of Cambridge**

**In the Year Two Thousand and Eight**

**AN ORDINANCE**

**In amendment to the Ordinance entitled "Municipal Code of the City of Cambridge"**

Be it ordained that Cambridge Municipal Code Chapter 2.112 is hereby amended by adding a new Section 2.112.060 entitled "CORI Screening by Vendors of the City of Cambridge" as follows:

Adding after Section 2.112.050 the following new sections:

**SECTION 2.112.060**

**CORI SCREENING BY VENDORS OF THE CITY OF CAMBRIDGE**

**Sections:**

- 2.112.061 Purpose**
- 2.112.062 Definitions**
- 2.112.063 CORI-Related Standards of the City of Cambridge**
- 2.112.064 Waiver**
- 2.112.065 Applicability**

**2.112.061 Purpose**

These sections are intended to ensure that the persons and businesses supplying goods and/or services to the City of Cambridge deploy fair policies relating to the screening and identification of persons with criminal backgrounds through the CORI system.

**2.112.062 Definitions**

Unless specifically indicated otherwise, these definitions shall apply and control.

*Awarding Authority* means the City of Cambridge Purchasing Agent or designee.

*Vendor* means any vendor, contractor, or supplier of goods and/or services to the City of Cambridge.

**2.112.063 CORI-Related Standards of the City of Cambridge**

The City of Cambridge employs CORI-related policies, practices and standards that are fair to all persons involved and seeks to do business with vendors that have substantially similar policies, practices and standards. The City of Cambridge will do business only with vendors who, when required by law to perform CORI checks, employ CORI-related policies, practices, and standards that are consistent with policies, practices and standards employed by the City of Cambridge. The awarding authority shall consider any vendor's deviation from policies, practices and standards employed by the City of Cambridge as grounds for rejection, rescission, revocation, or any other termination of the contract.

**Name of Bidder:** \_\_\_\_\_

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**2.112.064 Waiver**

The City Manager may grant a waiver to anyone who or which has submitted a request for waiver if it is objectively reasonable; and the City Manager, or a delegate, shall report promptly in writing to the City Council all action taken with respect to every request for a waiver and the reasons for the decision.

**2.112.065 Applicability**

If any provision of these sections imposes greater restrictions or obligations than those imposed by any other general law, special law, regulation, rule, ordinance, order, or policy then the provisions of these sections shall control.

In City Council January 28, 2008.

Passed to be ordained by a yea and nay vote:-

Yeas 9; Nays 0; Absent 0.

Attest:- D. Margaret Drury, City Clerk.

A true copy;

ATTEST:-

D. Margaret Drury  
City Clerk

Name of Bidder: \_\_\_\_\_

Chapter 2.121

LIVING WAGE ORDINANCE

Sections:

- 2.121.010 Title and Purpose
- 2.121.020 Definitions
- 2.121.030 Living Wage
- 2.121.040 Waivers and Exceptions
- 2.121.050 Notification Requirements
- 2.121.060 Duties of covered Employers
- 2.121.070 Community Advisory Board
- 2.121.080 Enforcement
- 2.121.090 Severability
- 2.121.100 Effective Date

2.121.010 Title and Purpose.

This Chapter shall be known as the "Cambridge Living Wage Ordinance". The purpose of this ordinance is to assure that employees of the City of Cambridge and employees of City contractors, subcontractors and beneficiaries of tax abatements, loans, grants, subsidies and other assistance provided by the City earn an hourly wage that is needed to support a family of four.

2.121.020 Definitions.

For the purposes of this ordinance, the term:

(a) "**Applicable Department**" means the Personnel Department for employees of the City of Cambridge, the Purchasing Department, with the advice and assistance of the appropriate department which receives the services, for Covered Employers who contract or subcontract with the City of Cambridge, the School Department for employees, contractors and subcontractors of the School Department, and the City Manager's Office for any other Person who is a Beneficiary of assistance other than a contract or subcontract.

(b) "**Assistance**" means:

(1) any grant, loan, tax incentive, bond financing, subsidy, or other form of assistance valued at least \$10,000 that an employer receives by or through the authority or approval of the City of Cambridge, including, but not limited to, c. 121A tax abatements, industrial development bonds, Community Development Block Grant (CDBG) loans and grants, Enterprise Zone designations awarded after the effective date of this Chapter, and the lease of city owned land or buildings below market value; and

(2) any service contract, as defined herein, of at least \$10,000 with the City of Cambridge that is made with an employer to provide services pursuant to G.L.c. 30B or other public procurement laws, awarded, renegotiated or renewed after the effective date of this Chapter.

(3) any service subcontract, as defined herein, of at least \$10,000.

(c) "**Beneficiary**" means:

(1) any person who is a recipient of Assistance;

(2) any company or person that is a tenant or sub-tenant, leaseholder or sub-leaseholder of a recipient of Assistance, provided that said company or person employs at least 25 persons and occupies property or uses equipment or property that is improved or developed as a result of Assistance, after the effective date of this Chapter; and

(d) "**Covered Employer**" means the City of Cambridge or a Beneficiary of Assistance.

(e) "**Covered Employee**" means:

(1) a person employed by the City of Cambridge except for persons in those positions listed in Section 2.121.040(j) of this ordinance; and

Name of Bidder: \_\_\_\_\_

(2) a person employed by a Covered Employer, or a person employed by an independent contractor doing business with a Covered Employer, who would directly expend any of his or her time on the activities funded by the contract or the activities for which the Beneficiary received the Assistance, except for persons in those positions listed in Section 2.121.040(j) of this ordinance..

(f) **"Living Wage"** has the meaning stated in Section 2.121.030.

(g) **"Person"** means one or more of the following or their agents, employees, servants, representatives, and legal representatives: individuals, corporations, partnerships, joint ventures, associations, labor organizations, educational institutions, mutual companies, joint-stock companies, trusts, unincorporated organizations, trustees, trustees in bankruptcy, receivers, fiduciaries, and all other entities recognized at law by the Commonwealth of Massachusetts.

(h) **"Service Contract"** means a contract let to a contractor by the City of Cambridge for the furnishing of services, to or for the City, except contracts where services are incidental to the delivery of products, equipment or commodities. A contract for the purchase or lease of goods, products, equipment, supplies or other property is not a "service contract" for the purposes of this definition.

(i) **"Service Subcontract"** means a subcontract primarily for the furnishing of services, to or for a recipient of Assistance, except where services are incidental to the delivery of products, equipment or commodities. A contract for the purchase or lease of goods, products, equipment, supplies or other property is not a "service subcontract" for the purposes of this definition.

#### 2.121.030 Living Wage.

(a) **Applicability.** Covered Employers shall pay no less than the Living Wage to their employees.

(b) **Amount of wage.** The Living Wage shall be calculated on an hourly basis and shall be no less than \$10.00, subject to adjustment as provided herein. The Living Wage shall be upwardly adjusted each year no later than March first in proportion to the increase at the immediately preceding December 31 over the year earlier level of the Annual Average Consumer Price Index for All Urban Consumers (CPI -U) Boston-Lawrence-Salem, MA - NH, as published by the Bureau of Labor Statistics, United States Department of Labor applied to \$10.00.

(c) **No reduction in collective bargaining wage rates.** Nothing in this Chapter shall be read to require or authorize any beneficiary to reduce wages set by a collective bargaining agreement.

(d) **Cuts in non-wage benefits prohibited.** No Beneficiary will fund wage increases required by this Chapter, or otherwise respond to the provisions of this Chapter, by reducing the health, insurance, pension, vacation, or other non-wage benefits of any of its employees.

#### 2.121.040 Waivers and Exceptions.

(a) **Waivers.** A Covered Employer may request that the City Manager grant a partial or whole waiver to the requirements of this Chapter.

(b) **General Waivers.** Waivers may be granted where application of this Chapter to a particular form of Assistance is found by the City Solicitor to violate a specific state or federal statutory, regulatory or constitutional provision or provisions, and the City Manager approves the waiver on that basis.

(c) **Hardship Waivers for certain not-for-profit employers.** An employer, who has a contract with the City of Cambridge which is not subject to the provisions of G.L. c. 30B, may apply to the City Manager for a specific waiver where payment of the Living Wage by a not-for-profit Covered Employer would cause a substantial hardship to the Covered Employer.

(d) **Chapter 30B contract waivers.** Prior to issuing an invitation for bids for a procurement contract subject to the provisions of G.L. c. 30B, any Applicable Department may apply to the City Manager for a waiver of the application of the Living Wage to the contract where payment of the Living Wage by a Covered Employer would make it inordinately expensive for the City to contract for the services or would result in a significant loss of services, because the contracted work cannot be segregated from the other work of the Covered Employer.

(e) **General Waiver Request Contents.** All General Waiver requests shall include the following:

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- (1) The nature of the Assistance to which this Chapter applies;
- (2) The specific or official name of the Assistance and Assistance program, the statutory or regulatory authority for the granting of the Assistance, and a copy of that authority;
- (3) The conflicting statutory, regulatory, or constitutional provision or provisions that makes compliance with this Chapter unlawful, and a copy of each such provision; and
- (4) A factual explication and legal analysis of how compliance with this Chapter would violate the cited provision or provisions, and the legal consequences that would attach if the violation were to occur.

**(f) Hardship Waiver Request Contents.** All Hardship Waiver requests shall include the following:

- (1) The nature of the Assistance to which this Chapter applies;
- (2) A detailed explanation of why payment of the Living Wage would cause a substantial hardship to the Covered Employer; and
- (3) A statement of proposed wages below the Living Wage.

**(g) Chapter 30B Contract Waiver Request Contents.** A Chapter 30B contract waiver request shall include the following:

- (1) The nature of the Assistance to which this Chapter applies;
- (2) A detailed explanation of why the contracted work cannot be segregated from the other work of the bidding Covered Employers thereby making the cost of the contract with the payment of the Living Wage inordinately expensive or would result in a significant loss of services;

**(h) Community Advisory Board review and recommendation regarding waiver requests.** The Community Advisory Board, as described in Section 2.121.070 of this ordinance, shall consider waiver requests along with their supporting documentation and analysis, and may hold a public hearing to consider the views of the public before making a recommendation to the City Manager regarding the waiver request. For a hardship waiver, the Community Advisory Board shall offer an opportunity to be heard to employees of the Covered Employer. After reviewing the recommendation of the Community Advisory Board, the City Manager may approve and grant or deny all or part of a request. The City Manager may in his or her discretion grant a temporary hardship waiver pending the hearing before the Community Advisory Board. For Chapter 30B contract waivers, the Community Advisory Board shall make its recommendation to the City Manager no more than thirty days after it is notified of the request for a Chapter 30B contract waiver.

**(i) Terms of exceptions.** If an employer is subject to this Chapter as a result of its receipt of more than one kind of Assistance covered by this Chapter, and if the City Manager grants a waiver with respect to one form of Assistance, the City Manager need not find that this Chapter is inapplicable to the employer with respect to another form of Assistance received by the employer.

**(j) Exceptions.** The following positions will be excepted from the requirement of the payment of the Living Wage upon certification in an affidavit in a form approved by the Applicable Department and signed by a principal officer of the Covered Employer that the positions are as follows:

- (1) youth hired pursuant to a city, state, or federally funded program which employs youth as defined by city, state, or federal guidelines, during the summer, or as part of a school to work program, or in other related seasonal or part-time program;
- (2) work-study or cooperative educational programs;
- (3) trainees who are given a stipend or wage as part of a job training program that provides the trainees with additional services, which may include, but are not limited to, room and board, case management, or job readiness services.
- (4) persons working in a recognized supported employment program that provides workers with additional services, which may include, but are not limited to, room and board, case management, counseling, or job coaching;
- (5) positions where housing is provided by the employer;
- (6) employees who are exempt from federal or state minimum wage requirements; and
- (7) individuals employed by the City of Cambridge where the employment of such individuals is intended primarily to provide a benefit or subsidy to such individuals, although the City is compensating them for work performed.

#### **2.121.050 Notification Requirements.**

All Applicable Departments shall provide in writing an explanation of the requirements of this ordinance in all requests for bids for service contracts and to all persons applying for Assistance as defined by this ordinance. All persons who have signed a service contract with the City of Cambridge or a contract for Assistance shall forward a copy of such requirements to any person submitting a bid for a subcontract on the Assistance contract.

#### **2.121.060 Duties of Covered Employers.**

Name of Bidder: \_\_\_\_\_

**(a) Notification Requirements.** Covered employers shall provide each Covered employee with a fact sheet about this ordinance and shall post a notice about the ordinance in a conspicuous location visible to all employees. The fact sheet and poster shall be provided to the Covered Employer by the Applicable Department and shall include:

- (1) notice of the Living Wage amount;
- (2) a summary of the provisions of this ordinance;
- (3) a description of the enforcement provisions of the ordinance;
- (4) the name, address, and phone number of a person designated by the Applicable Department to whom complaints of noncompliance with this ordinance should be directed.

**(b) Contract for Assistance.** At the time of signing a contract for assistance with the City of Cambridge or with a Beneficiary, the contract must include the following:

- (1) the name of the program or project under which the contract or subcontract is being awarded;
  - (2) a local contact name, address, and phone number for the Beneficiary;
  - (3) a written commitment by the Beneficiary to pay all Covered Employees not less than the Living Wage as subject to adjustment under this ordinance and to comply with the provisions of this ordinance;
  - (4) a list of Covered Employees under the contract with the employees' job titles;
  - (5) a list of all subcontracts either awarded or that will be awarded to Beneficiaries with funds from the Assistance.
- Upon signing any subcontracts, the Covered Employer shall forward a copy of the subcontract to the Applicable Department.

**(c) Maintenance of payroll records.** Each Covered Employer shall maintain payrolls for all Covered Employees and basic records relating thereto and shall preserve them for a period of three years. The records shall contain the name and address of each employee, the job title and classification, the number of hours worked each day, the gross wages, deductions made, actual wages paid, and copies of social security wage and withholding reports, and evidence of payment thereof and such other data as may be required by the Applicable Department from time to time.

**(d) Applicable Department duties.** The Applicable Department shall cause investigations to be made as may be necessary to determine whether there has been compliance with this Ordinance. The Applicable Department shall report the findings of all such investigations to the Community Advisory Board.

**(e) Covered Employer to cooperate.** The Covered Employer shall submit payroll records on request to the Applicable Department. The Covered Employer shall permit City representatives to observe work being performed upon the work site, to interview employees and to examine the books and records relating to the payrolls being investigated to determine payment of wages.

**(f) City Assistance Reports.** Each Applicable Department shall file a City Assistance Report with the City Manager and the Community Advisory Board by July 31 of each year. The report shall include, for each Assistance package or contract approved during the preceding fiscal year:

- (1) the name of the Applicable Department (awarding agency), the name of the specific program under which the Assistance was awarded, and the origin of funds for Assistance;
- (2) a description of the purpose or project for which the Assistance was awarded;
- (3) the name, address, and phone number of a local contact person for the Covered Employer;
- (4) the total cost to the City of Assistance provided to each Beneficiary, including both face-value of Assistance, as well as revenue not collected as a result of the Assistance.

## 2.121.070 Community Advisory Board.

**(a) Purpose.** The purpose of the Community Advisory Board shall be to review the effectiveness of this Ordinance at creating and retaining Living Wage jobs, to make recommendations to the City Manager regarding the granting of Waivers to Covered Employers, to review the implementation and enforcement of this ordinance, and to make recommendations from time to time in connection therewith.

**(b) Composition.** The Community Advisory Board shall be composed of nine members and shall include representatives of labor unions, community organizations and the business community. All members will be appointed by the City Manager. Members of the Board shall serve a three-year term. Whenever a vacancy shall occur the City Manager shall appoint a replacement within thirty days of said vacancy.

**(c) Meetings.** The Community Advisory Board shall meet quarterly and in special session as required. All meetings of the Board shall be open to the public and will allow for public testimony on the uses of the City Assistance generally, and on specific instances of Assistance or proposed Assistance as received or sought by individual enterprises.

Name of Bidder: \_\_\_\_\_

**(d) Conflict of Interest.** No member of the Community Advisory Board shall participate in any proceeding concerning a Beneficiary, a Covered Employer or a Covered Employee, or applicant for waiver or exemption, if the member or any member of his or her immediate family has a direct or indirect financial interest in the outcome of said proceeding.

**2.121.080 Enforcement.**

**(a) Enforcement powers.** In order to enforce this Chapter, the Applicable Department may, with the approval and assistance of the City Solicitor, issue subpoenas, compel the attendance and testimony of witnesses and production of books, papers, records, and documents relating to payroll records necessary for hearing, investigations, and proceedings. In case of failure to comply with a subpoena, the City may apply to a court of appropriate jurisdiction for an order requiring the attendance and testimony of witnesses and the productions of books, papers, records, and documents. Said court, in the case of a refusal to comply with any such subpoena, after notice to the person subpoenaed, and upon finding that the attendance or testimony of such witnesses or the production of such books, papers, records, and documents, as the case may be, is relevant or necessary for such hearings, investigation, or proceedings, may issue an order requiring the attendance or testimony of such witnesses or the production of such documents and any violation of the court's order may be punishable by the court as contempt thereof.

**(b) Complaint procedures.** An employee who believes that he or she is a Covered Employee or an applicant for a position to be filled by a Covered Employee who believes that his or her employer is not complying with requirements of this Chapter applicable to the employer may file a complaint with the Applicable Department or with the Community Advisory Board. Complaints of alleged violations may also be filed by concerned citizens or by the City Council. Complaints of alleged violations may be made at any time, but in no event more than three years after the last date of alleged violation, and shall be investigated promptly by the Applicable Department. Statements written or oral, made by an employee, shall be treated as confidential and shall not be disclosed to the Covered Employer without the consent of the employee.

**(c) Investigations and hearings.** The Applicable Department shall investigate the complaint, and may, in conjunction with the City Solicitor, and in accordance with the powers herein granted, require the production by the employer of such evidence as required to determine compliance. Prior to ordering any penalty the applicable Department shall give notice to the employer and conduct a hearing. If at any time during these proceedings, the employer voluntarily makes restitution of the wages not paid to the employee making the complaint and to any similarly situated employees, by paying all back wages owed plus interest at the average prior year Massachusetts passbook savings bank rate, or otherwise remedies the violation alleged if the violation involves matters other than wages, then the Applicable Department shall thereafter dismiss the complaint against the employer.

**(d) Remedies.** In the event that the Applicable Department, after notice and hearing, determines that any Covered Employer has failed to pay the Living Wage rate or has otherwise violated the provisions of this Chapter, the Applicable Department may order any or all of the following penalties and relief:

(1) Fines up to the amount of \$300 for each Covered Employee for each day that the Covered Employer is in violation of this Ordinance, except if the violation was not knowing and willful, then the total fine shall not exceed the amount of back wages plus interest owed;

(2) Suspension of ongoing contract and subcontract payments;

(3) Ineligibility for future City Assistance for up to three years beginning when all penalties and restitution have been paid in full. In addition, all Covered Employers having any principal officers who were principal officers of a barred beneficiary shall be ineligible under this section; and

(4) Any other action deemed appropriate and within the discretion and authority of the city.

Remedies in this section shall also apply to the party or parties aiding and abetting in any violation of this chapter.

**(e) Private right of action.** Any Covered Employee, or any person who was formerly employed by a Beneficiary, may bring an action to enforce the provisions of this Chapter to recover back pay and benefits, attorneys fees and costs, by filing suit against a Beneficiary in any court of competent jurisdiction.

**(f) Remedies herein non-exclusive.** No remedy set forth in this Chapter is intended to be exclusive or a prerequisite for asserting a claim for relief to enforce the right granted under this Chapter in a court of law. This Chapter shall not be construed to limit an employee's right to bring a common law cause of action for wrongful termination.

**(g) Retaliation and discrimination barred.** A Covered Employer shall not discharge, reduce the compensation or otherwise retaliate against any employee for making a complaint to the City, otherwise asserting his or her rights under this Chapter, participating in any of its proceedings or using any civil remedies to enforce his or her rights under the Chapter. The City shall investigate allegations of retaliation or discrimination and shall, if found to be true, after notice and a hearing, order appropriate relief as set out in paragraphs (c) and (d) herein

Name of Bidder: \_\_\_\_\_

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**2.121.090 Severability.**

In the event any provision of this ordinance shall be held invalid or unenforceable by any court of competent jurisdiction, such holding shall not invalidate or render unenforceable any other provisions hereof.

**2.121.100 Effective Date.**

This law shall be effective sixty (60) after final passage.  
The Living Wage Ordinance (2.121) provides, at 1.121.030(b) that the wage shall be upwardly adjusted each year no later than March 1<sup>st</sup> in proportion to the increase in the Annual Average Consumer Price Index for the prior calendar year for All Urban Consumers (CPI-U) in the Boston area, as published by the federal Bureau of Labor Statistics.

For calendar year 1999, the CPI-U increased by 2.5%. Therefore the new living wage, as of March 1, 2000 is \$10.25.

For calendar year 2000, the CPI-U increased by 4.3%. Therefore the new living wage, as of March 1, 2001 is \$ 10.68.

For calendar year 2001, the CPI-U increased by 4.3%. Therefore the new living wage, as of March 1, 2002 is \$11.11.

For calendar year 2002, the CPI-U increased by 2.6% . Therefore the new living wage, as of March 1, 2003 is \$11.37.

The City Council has voted to amend the section of the Living Wage Ordinance (1.121.030 (b) that provides the method for calculating cost of living increases each year. As a result of this change, the living wage as of March 30, 2003 is \$11.44.

For calendar year 2003, the CPI-U increased by 3.76%. Therefore the new living wage, as of March 1, 2004 is \$11.87.

For calendar year 2004, the CPI-U increased by 2.7%. Therefore the new living wage, as of March 1, 2005 is \$12.19.

For calendar year 2005, the CPI-U increased by 3.3%. Therefore the new living wage, as of March 1, 2006 is \$12.59.

For calendar year 2006 the CPI-U increased by 3.1 %. Therefore the new living wage, as of March 1, 2007 is \$12.98.

For calendar year 2007 the CPI-U increased by 1.9 %. Therefore the new living wage, as of March 1, 2008 is \$13.23.

For calendar year 2008 the CPI-U increased by 3.5 %. Therefore the new living wage, as of March 1, 2009 is \$13.69.

For calendar year 2009 the CPI-U decreased by .67 %. Therefore the new living wage, as of March 1, 2010 will remain at \$13.69.

For calendar year 2010 the CPI-U increased by 1.57%. Therefore the new living wage, as of March 1, 2011 is \$13.90.

For calendar year 2011 the CPI-U increased by 2.71%. Therefore the new living wage, as of March 1, 2012 is \$14.28.

Name of Bidder: \_\_\_\_\_

City of Cambridge  
Articles of Agreement

SAMPLE SAMPLE SAMPLE SAMPLE

Commodity:  
File Number:

This agreement is made and entered into this \_\_\_\_\_, by and between the **City Of Cambridge** ("the CITY"), a municipal corporation organized and existing under the laws of the Commonwealth of Massachusetts, and \_\_\_\_\_, existing under the laws of the State of \_\_\_\_\_ ("the Contractor").

Address:

Telephone, Fax, E-mail:

**Article I. Definition.** "This Contract" as used herein shall mean these Articles of Agreement and "the bid documents," which include, but are not limited to, the instructions to bidders, the Contractor's bid or proposal, the specifications, the general conditions, the requirements, the applicable addenda, and all documents and forms submitted with the Contractor's bid or proposal that were accepted by the City.

**Article II. Duration.** The Contractor shall commence the performance of this contract for the period beginning on \_\_\_\_\_ and ending on \_\_\_\_\_.

**Article III. Terms.** The Contractor agrees to provide the services all in accordance with the bid documents of (bid opening date) or (proposal if appropriate).

Contract Value:

**Article IV. Payment.** The City agrees to pay to Contractor the sum set forth in the Contractor's bid or proposal. **Contractor shall invoice department to which it provided the service, not the Purchasing Department.**

**Article V. Termination.** The following shall constitute events of default under this Contract requiring immediate termination: a) any material misrepresentation made by the Contractor, b) any failure by the Contractor to perform any of its obligations under this Contract including, but not limited to, the following: (i) failure to commence performance of this Contract at the time specified in this Contract due to a reason or circumstance within the Contractor's reasonable control, (ii) failure to perform this Contract with sufficient personnel and equipment or with sufficient material to ensure the completion of this Contract within the specified time due to a reason or circumstance within the Contractor's reasonable control, (iii) failure to perform this Contract in a manner reasonably satisfactory to the City, (iv) failure to promptly re-perform within reasonable time the services that were rejected by the City as erroneous or unsatisfactory, (v) discontinuance of the services for reasons not beyond the Contractor's reasonable control, (vi) failure to comply with a material term of this Contract, including, but not limited to, the provision of insurance and nondiscrimination, and (vii) any other acts specifically and expressly stated in this Contract as constituting a basis for termination of this Contract.

Except as otherwise provided in the Articles of Agreement, the City may terminate the contract upon seven days notice.

**Article VI. Damages.** From any sums due to the Contractor for services, the City may keep for its own the whole or any part of the amount for expenses, losses and damages as directed by the Purchasing Agent, incurred by the City as a consequence of procuring services as a result of any failure, omission or mistake of the Contractor in providing services as provided in this Contract.

**Article VII. Conflict.** In the event there is a conflict between these Articles and the bid documents, the bid documents shall supersede these articles.

Name of Bidder: \_\_\_\_\_

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Thursday, September 27, 2012 @ 11:00 AM

**Article VIII. Governing laws and ordinances.** This Contract is made subject to all the laws of the Commonwealth and the Ordinances of the City and if any such clause thereof does not conform to such laws or ordinances, such clause shall be void (the remainder of the Contract shall not be affected) and the laws or ordinances shall be operative in lieu thereof.

**Article IX. Performance Security.** Upon execution of this Contract by the Contractor, the Contractor shall furnish to the City security for the faithful performance of this Contract in the amount of 100% of the value of the bid in the form of a performance bond issued by a surety satisfactory to the city or in the form of a certified check.

**Article X. Equal Opportunity.** the Contractor in the performance of all work under this contract will not discriminate on the grounds of race, color, sex, age, religious creed, disability, national origin or ancestry, sexual orientation, marital status, family status, military status, or source of income in the employment practices or in the selection or retention of subcontractors, and in the procurement of materials and rental of equipment. The city may cancel, terminate or suspend the contract in whole or in part for any violation of this article.

**Article XI. Assignability.** the Contractor shall not assign, sell, subcontract or transfer any interest in this contract without prior written consent of the city.

In witness whereof the parties have hereto and to three other identical instruments set their hands the day and year first above written.

Approved as to Form:

The Contractor:

\_\_\_\_\_  
Nancy E. Glowa  
Acting City Solicitor

\_\_\_\_\_  
Signature and Title

\_\_\_\_\_  
Robert W. Healy  
City Manager

\_\_\_\_\_  
Cynthia H. Griffin  
Purchasing Agent

Name of Bidder: \_\_\_\_\_