

ADVERTISEMENT FOR BIDS

**NEW FIRE DEPARTMENT AERIAL LADDER TRUCK**

Town of Westbrook, Connecticut

Sealed bids for the purchase of an **NEW FIRE DEPARTMENT AERIAL LADDER TRUCK** for the Town of Westbrook Fire Department will be addressed to Chief Michael Jenkins, Westbrook Fire Department, and will be received at the First Selectman's Office, Town Hall, 866 Boston Post Road, Westbrook, CT 06498, until noon prevailing local time on August 1, 2013. The bids will be publicly opened and read aloud at 5:00 p.m. Westbrook Fire Department is looking for a 70' to 75' aerial platform ladder with maximum truck height of 10' 8" and a maximum truck length of 42'.

Bid Specifications are available by request through the Westbrook Fire Department at (860) 399-3473 from 8:00 a.m. to 4:00 p.m. Monday thru Thursday or by email at [wfd@snet.net](mailto:wfd@snet.net). All questions can be referred to [wfd@snet.net](mailto:wfd@snet.net) and will be answered within 24 hours.

The Bidder agrees that this bid shall be good and may not be withdrawn for a period of 30 working days, Saturdays, Sundays and legal holidays excluded after the opening of bids.

The Owner reserves the right to waive any informalities or to reject any or all bids.

TOWN OF WESTBROOK, CONNECTICUT

BY ANDREW URBAN, DIRECTOR OF FINANCE

Town of Westbrook 0200 INFORMATION FOR BIDDERS –  
New Fire Department Aerial Ladder Truck

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SECTION 0200

INSTRUCTIONS TO BIDDERS

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## **1. RECEIPT AND OPENING OF BIDS**

The Town of Westbrook, Connecticut, herein called the Town, acting by and through its Board of Selectmen, will receive sealed Bids for the equipment to be acquired under this Contract, including the following, all as indicated in the specifications contained herein:

A. Furnish the equipment as specified below:

A 70' to 75' Aerial Platform Ladder with maximum truck height of 10' 8" and a maximum truck length of 42' as described in the Bid Specifications.

B. The provision of all incidentals to complete work as described above.

Such Bids, addressed to Town of Westbrook, 866 Boston Post Road, Westbrook, CT 06498, and clearly marked "BID FOR New Fire Department Aerial Ladder Truck" will be received at the First Selectman's Office, until the date and time listed in Section 0100 Advertisement for Bids.

## **2. BID FORM**

A. Bid Forms must be PRINTED in ink or by computer.

B. A Bid which includes for any item a Bid Price that is abnormally low or high may be rejected as unbalanced.

## **3. BID OPENING PROCEDURES**

A. Bid signatures will be checked.

B. Acknowledgement of addenda (if any) will be checked (see Section 0410, Form of General Bid).

C. The total dollar amount of each bid will be read, and the individual bid prices for each item of the three apparent low bidders will be read.

D. The bid form attachments will be verified to be included with the bid and signatures confirmed. The review of the bid form attachments (if any) will be completed following the bid opening.

E. The bid opening will then be closed. All those present at the bid opening may examine any of the bids after close of the bid opening.

## **4. COMPARISON OF BIDS**

A. Bids will be compared on the basis of the prices stated in Section 0410, Form of General Bid.

## **5. WITHDRAWAL OF BIDS**

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Bidders may not withdraw or modify their bids for a period of 90 days, Saturday, Sunday and legal holidays excluded, following the opening of the bids.

**6. ADDENDA AND INTERPRETATIONS**

All questions by prospective bidders as to the interpretations of the Advertisement for Bids, Form of General Bid, Agreement, Specifications, must be submitted in writing to the attention of Chief Michael Jenkins, Westbrook Fire Department., at least ten (10) days before the date herein set for the opening of bids. An interpretation of all questions so raised which, in the Town's opinion requires interpretation, will be mailed to prospective bidders at the addresses given by them not later than five (5) days before the date of opening of bids. No other form of communication in this regard will be considered legal and binding. Failure of any bidder to receive any such addendum or interpretation shall not relieve such bidder from any obligation under this bid as submitted. All addenda so issued shall be covered in the Bid and shall become part of the Contract Documents.

**7. DELETIONS FROM CONTRACT**

The Town reserves the right, prior to award of the Contract, to delete any portion of the Vendor's work as its interests may appear, and to adjust the quantities of work at any time.

**8. EXAMINATION**

By submitting a bid, the bidder warrants that they have examined the site of the work, the specifications and drawings and is fully acquainted with all conditions and restrictions pertaining to the work and the execution thereof. No claim for any extra work or extension of time will be allowed for failure to observe this requirement. Conditional bids will not be accepted.

**9. CONTRACT TIME**

The Town wishes to proceed with this project as soon as possible. An appropriation for this acquisition was voted upon by the Town Board of Finance on May 15, 2013. Delivery and installation of the equipment may proceed after that date.

**10. ABILITY AND EXPERIENCE**

A. The Town will not award a contract to any bidder who cannot furnish satisfactory evidence of their ability and experience in this type of work and that they have sufficient plant and capital to enable them to perform and complete the work within the given time period.

B. The Town may make such investigations as it deems necessary to determine the above and a bidder shall furnish any information requested in this regard and shall furnish same under oath if required.

**11. RIGHTS OF THE TOWN**

A. The Town may reject, as informal, bids that are incomplete, conditional, or obscure, or that contain additions or erasures that are not initialed or other irregularities.

B. The Town reserves the right to reject any or all bids or to accept any bid as their interests may appear.

C. The Town anticipates awarding a contract for this procurement within thirty (30) days of the date of bid opening; however, this date is subject to change. Bidders shall be prepared to submit within four (4) working days all documents and information required for full execution of a contract. If the Vendor fails to do so, the Town reserves the right to rescind the Contract Award.

## **12. EXECUTION OF THE CONTRACT**

A. Within ten (10) days of the receipt of the contract signed by the successful bidder, the Town shall sign the contract and return a duplicate of the executed contract.

B. The Notice to Proceed shall be issued within ten (10) days of the execution of the contract. This time period may be extended by mutual agreement between the Town and the Vendor.

## **13. "OR EQUAL" CLAUSE**

A. Whenever the specifications define the material or article required by using the name of the proprietary product or of a manufacturer or vendor rather than by using descriptive detail of substance and function, the words "or equal" are to be understood to follow immediately the name of the maker, vendor, or proprietary product. The words, "or equal" shall be interpreted as including any material or article which, in the opinion of the Town, is equal in quality durability, appearance, strength, and design to the article named and which will perform adequately the functions imposed by the general design.

B. Whenever in the specifications the names of manufacturers are mentioned as indicating that their products will comply with a particular specification, or when specific trade names or plate numbers or letters are mentioned, it is not intended to exclude products of other manufacturers whose names, trade names or symbols have not been mentioned, provided however, that such products otherwise comply, in the opinion of the Town, with the specification. The Town's opinion in all cases mentioned in this section shall be final.

## **14. WARRANTY/GUARANTEE**

A. The Vendor guarantees that the work and services to be performed under the Contract and all work, material, and equipment performed, furnished, used or installed in the construction of the same, shall be free from defects and flaws and shall be performed and furnished in strict accordance with the Specifications and other Contract Documents; that the strength of all parts of all manufactured equipment shall be adequate and as specified and that the performance test requirements of the Contract shall be fulfilled. This guarantee shall be for a minimum period of one (1) year from and after the date of completion and acceptance of the work as stated in the final estimate. If part of the work is accepted by the Town, the guarantee for that part of the work shall be for a period of one (1) year from the date fixed for such acceptance.

B. If at any time within said period of guarantee any part of the work requires repairing, correction or replacement, the Town may notify the Vendor in writing to make the required

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repairs, correction or replacements. If the Vendor neglects to commence making such repairs, corrections or replacements to the satisfaction of the Town within 24 hours from the date of receipt of such notice, or having commenced fails to prosecute such work with diligence, the Town may employ other persons to make the same, and all direct and indirect costs of making said repairs, corrections or replacements, including compensation for additional professional services, shall be paid by the Vendor.

C. It is hereby, however, agreed and understood that this guarantee shall not include any repairs or replacements made necessary by any cause or causes other than improper, inadequate, or defective work, quality of the work, materials or design by the Vendor or those employed directly or indirectly by the Vendor.

**15. METHOD OF AWARD - QUALIFIED BIDDER**

A. The Contract will be awarded on the basis of a responsible and responsive bid as submitted by a Qualified Bidder if such bid does not exceed the amount of funds available to finance the purchase.

B. The Town shall have the right to accept or reject Alternates.

C. Per Section 2-3e of the Town Bid Ordinance: In the event two or more bids or proposals are received which are of a substantially comparable total amount or unit price, and the quality and service being substantially similar with no evidence of collusion, the Board may award the contract to a contractor or supplier having his or her or its principal place of business located in the Town of Westbrook.

**16. SEVERABILITY**

If any provisions of this Agreement or portion of such provision of the application thereof to any persons, entity, or circumstances is held invalid, the remainder of the Agreement (or remainder of such provision) and the application of such to other persons, entities, or circumstances shall not be affected thereby so long as such remaining or modified provisions reflect the intent of the parties.

**17. BID SUBMITTAL REQUIREMENTS**

A complete bid shall consist of all of the following:

SECTION 0300 – FORM OF GENERAL BID

**Failure to submit a bid that includes both the Bid Form and all Bid Form attachments listed above may result in bidder's disqualification by the TOWN.**

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## INTENT OF SPECIFICATIONS

It is the intent of these specifications to cover the furnishing and delivery to the purchaser of a complete fire apparatus equipped as specified herein; with the intent to obtain the best results and the most acceptable apparatus for emergency service use in the community of the purchaser. These specifications cover the minimum general requirements as to the type of construction and tests to which the apparatus must conform, together with certain details as to finish, equipment and appliances with which the successful bidder must conform. Minor details of construction and materials, where not otherwise specified, are left to the discretion of the contractor, who shall be solely responsible for the design, engineering and construction of all features.

Y\_\_N\_\_

## COMPLIANCE WITH NFPA 1901

The National Fire Protection Association Standard “NFPA 1901 - Standard for Automotive Fire Apparatus - Current Edition” (hereinafter referred to as NFPA 1901) in effect at the time of the purchase shall be used as a reference and its requirements shall be met by the bidder. Bidder shall construct the apparatus in accordance with federal and state laws effective at the time of purchase. Any federal, state or NFPA amended changes that shall affect the cost of producing said apparatus shall be charged to the purchaser. Mandatory minor apparatus equipment as stated in the applicable paragraphs (5.8, 6.7, 7.7, 8.8, 9.8, 10.5, 11.9 and respective subparagraphs) of the NFPA standard shall not be provided unless specifically stated and listed in purchaser's written specifications. Any and all references to “NFPA 1901” within this document shall refer to the current edition of NFPA 1901 in effect at the time of the purchase.

Y\_\_N\_\_

## PURCHASER’S NFPA 1901 RESPONSIBILITIES

In accordance with NFPA 1901, current edition, it shall be the responsibility of the purchaser to specify the following details of the apparatus:

- Its required performance, including where operations at or above elevations of 2000 ft. or on grades greater than 6 percent are required.
- The maximum number of firefighters to ride within the apparatus.
- Specific electrical loads that are to be part of the minimum continuous electrical load defined in 13.3.3 of NFPA 2003.
- Any hose, ground ladders, or equipment to be carried by the apparatus that exceed the minimum requirements of the NFPA 1901 standard in effect at the time of the bid. Equipment weight and location on the apparatus are the responsibility of the purchaser as a prerequisite of defining the loaded vehicle’s vertical center of gravity for rollover stability calculations, when required.

Y\_\_N\_\_

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## ACQUAINTANCE WITH SPECIFICATIONS

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

Y\_\_N\_\_

## ERRORS AND OMISSIONS

Any error or omission in the specifications shall be reported immediately to the purchaser for correction, prior to bidding.

Y\_\_N\_\_

## PROTOTYPE OR EARLY PRODUCTION APPARATUS

No prototype, experimental or early production apparatus shall be accepted. The bidder shall demonstrate that they have successfully produced apparatus of the same design in the past, and that those apparatus have a repair history that is acceptable to the purchaser.

Y\_\_N\_\_

## UNSOLICITED PROPOSALS

All bidders shall submit only one (1) bid, which meets or exceeds the specifications. Bids on alternate, stock or demonstrator units are not being solicited. Any such bids shall be considered non-responsive and shall not be considered. Total exception to the bid specifications will be cause for immediate rejection. There shall be no exceptions to these conditions.

Y\_\_N\_\_

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## COMPANY OVERVIEW AND HISTORY

Each bidder shall include in their bid proposal a clear overview of their company's manufacturing history, particularly as it relates to the manufacturing of fire apparatus. The bidder shall also include specifics about the factory location in which the apparatus they are bidding will be manufactured.

Y\_\_N\_\_

## RELIABILITY OF MANUFACTURER

Bids shall only be considered from companies which have an established reputation in the field of fire apparatus construction and have been building fire apparatus and fire apparatus steel aerial devices for a minimum of 30 years.

Bids shall only be considered from manufacturers who are full time fire apparatus manufacturers and who are current members of the Fire Apparatus Manufacturers Association (FAMA).

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 manufactured. Each bidder shall also show that they are in a position to render prompt service and to furnish replacement parts for said apparatus.

Y\_\_N\_\_

## REFERENCES

The manufacturer shall be satisfactory to the purchaser, from the standpoint of experience, reliability and demonstrated ability to manufacture fire apparatus comparable in size and type to the fire apparatus specified herein. The manufacturer shall provide a list of references with contact name and phone number to support this.

Y\_\_N\_\_

## MANUFACTURER'S LIABILITY

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

Y\_\_N\_\_

## STANDARD PLACEMENT OF COMPONENTS

Any deviation from the apparatus manufacturer's standard placement shall incur additional charges.

Y\_\_N\_\_

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## BID SUBMISSION

Bidders are required to complete and return this bid document. Bidders are required to complete the Bidder Compliance column truthfully. If a bidder believes that they have met the intent of the specification paragraph, but do not meet the exact requirements of the specification, then they shall write "Exception" in the Bidder Compliance column and document that exception accordingly. Failure to adequately document an exception shall be considered a "Not Compliant" response. *BE ADVISED: This document, and all responses and exception taken therein, shall become part of the contract.*

Each bid shall be accompanied by a "Contractor's Proposal" consisting of a detailed description written by the manufacturer of the apparatus and equipment proposed and to which the apparatus furnished under contract shall conform. To facilitate accurate and timely bid evaluation, the Contractor's Proposal shall be ordered in the same sequence as the purchaser's bid specification. In no case shall a bidder submit a copy of the purchaser's specifications as their Contractor's Proposal. Failure to comply with these requirements shall be cause for bid rejection.

The total price on the bidder's proposal sheet must include all items in the purchaser's specifications. Listing any requirement contained in the specifications as an option at additional cost shall automatically be cause for bid rejection.

Y\_\_N\_\_

## EXCEPTION TO SPECIFICATIONS

Any exception or variation in construction, performance, test or items of equipment between this purchaser's specification and the bidder's proposal shall be detailed and submitted as an exception. The following requirements shall be strictly adhered to:

- A. Exceptions will be allowed if they are equal to or superior to that specified and provided they are listed and fully documented and explained on a separate page entitled "EXCEPTIONS TO SPECIFICATIONS". The exception list shall refer to specification page number and paragraph.
- B. All exceptions or deviations must be approved in writing by the Fire Department or the jurisdiction having authority. The purchaser shall be the sole judge as to whether an exception or variation meets or exceeds the specification and reserves the right to determine which, if any, exceptions or deviations are acceptable.
- C. Proposals taking total exception to specifications shall not be accepted.
- D. The apparatus shall be inspected upon delivery for compliance with the specifications. Deviations shall not be allowed and shall be cause for rejection of apparatus unless they were originally listed in bidder's proposal and approved in writing by the purchaser.

Y\_\_N\_\_

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## BID SELECTION/AWARD CRITERIA

The purchaser reserves the right to reject any or all proposals, or to accept such proposal that, in the purchaser's sole opinion, is in the best interest of the purchaser. The purchaser does not, in any way, obligate itself to accept the lowest bid.

The selection of the successful bidder will be based on a combination of factors which, in the purchaser's sole opinion, will best serve the purchaser's interest in obtaining the desired service levels. Factors that will be considered, but shall not be limited to, are:

- Experience
- Capability
- Prices
- Past performance
- References
- Responsiveness to the bid document
- Delivery time
- Quality of item(s) bid
- Warranty Coverage
- Service ability and location

Y\_\_N\_\_

## COMPLETION DATE

Each bidder shall include in their proposals the number of calendar days for delivery of the completed apparatus, from the receipt of the complete order and signed approval drawing.

Y\_\_N\_\_

## FINANCING ALTERNATIVES SOLICITED

In order for the purchaser to make the best informed decision regarding the acquisition of the apparatus/equipment specified in the bid document, all bidders shall provide detailed information regarding financing alternatives, such as tax-exempt leases, with their bid replies.

Y\_\_N\_\_

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## INSURANCE REQUIREMENTS

The manufacturer shall maintain insurance coverage including product liability coverage, general liability coverage and workman's compensation insurance coverage. The minimum acceptable liability insurance amount shall be twenty-five (25) million dollars coverage from the primary manufacturer. The bidder shall submit with the bid proposal the name of the insurance company, policy number, coverage amounts and effective dates of the insurance policy. Bids submitted without this information or the proper types and amounts of coverage shall be considered non-responsive and shall be automatically and immediately rejected. No exceptions are allowed on these requirements.

Y\_\_N\_\_

## BID BONDS

Each bidder shall supply with their bid proposal a bid bond in the amount of 10% of the proposed contract amount. Bid bonds by salesmen or agents of the manufacturer are not acceptable. Bids must remain firm for a period of 60 days. All required insurance coverage shall be underwritten by insurers legally allowed to conduct business in all states of the U.S. and shall have a policy holders rating of "A" or better in the latest evaluation by A. M. Best Co.

Proposals received from bidders who do not build the chassis or the aerial device shall provide a warranty that is issued jointly and severally by, and signed by, both the bidder and both the aerial and chassis manufacturers. Bidders who build their own chassis and aerial device shall provide a warranty issued in their name only.

If the successful bidder does not manufacturer the chassis or aerial device, the bidder shall supply a separate warranty bond which guarantees all terms and conditions of the warranty and names, as co-principals, the bidder and both the chassis and aerial manufacturers. 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.

Bidders who assemble aerial devices but do not manufacture the major components such as the turntable or ladder sections must also provide the warranty and warranty bond as described above except the subcontractor for these components must also be one of the signatories of the warranty and be named a co-principal of the warranty bond.

No exception to these requirements shall be allowed if the bid is to be considered compliant.

Y\_\_N\_\_

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## APPROVAL DRAWINGS

Following the completion of the pre-construction conference, three (3) sets of engineering, blueprint type drawings, specifically for this apparatus, shall be provided by the manufacturer and shall be approved by the Fire Department before construction begins. Both the Fire Department and the manufacturer's representative shall have a copy of this drawing. It shall become part of the total contract. These drawings shall be drawn to scale on a CAD system to assure an accurate and professional drawing. The drawing shall show five (5) views of the vehicle (front, rear, both sides and top). The drawings shall show the wheelbase and overall dimensions of the apparatus, final compartment sizes and features, booster tank position, the location of all emergency warning equipment, work and scene lights, and all changes, if any, mutually agreed to during the pre-construction conference.

Y\_\_N\_\_

## PRE-CONSTRUCTION CONFERENCE

A pre-construction conference shall be held at the factory of the successful bidder. The conference shall be scheduled during normal business hours, Monday - Friday. All expenses for transportation, meals and lodging for three (3) representatives of the purchaser shall be included in the bid price. The conference shall be of sufficient duration to complete the business required. A distributor or sales representative shall accompany the purchaser on the trip. The conference shall be held prior to the commencement of any work being done on the apparatus. Factory sales and engineering personnel shall participate in the conference as needed to ensure that the apparatus fulfills all the requirements of the accepted bid. Authorized representatives from both the purchaser and manufacturer shall approve and sign any changes made during these meetings prior to the commencement of any work being done on the apparatus.

It is understood and agreed that delays beyond thirty (30) days of contract approval for pre-construction conference changes in specifications shall be cause for delay in delivery.

Y\_\_N\_\_

## DIGITAL PICTURES

Digital pictures shall be taken of the apparatus in place of an "in-process" inspection. On a given day determined by the manufacturer, a quantity of thirty-six (36) pictures shall be taken of the apparatus. Depending upon the type of apparatus, the pictures may include any or all of the following: cab interior and exterior, pump operators stand, body and aerial device.

Y\_\_N\_\_

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## FINAL INSPECTION TRIP

One (1) final inspection trip for three (3) representatives of the purchaser shall be included in the bid. The inspection shall take place at the successful bidder's factory during normal business hours, Monday - Friday. The cost of transportation, meals and lodging shall be included. A distributor or sales representative shall accompany the purchaser on the inspection trip. The trip shall be of sufficient duration to complete the business required. The apparatus to be inspected shall be in finished condition and ready for shipment when the final inspection is conducted.

Y\_\_N\_\_

## UNDERSIDE FINAL INSPECTION

During Final Inspection, the complete vehicle shall be raised, allowing the Fire Department Inspection team to walk under the apparatus to review the complete underside.

Y\_\_N\_\_

## PRE-DELIVERY ROAD TRIP AND FINAL FACTORY CHECKLIST

Prior to delivery, the completed apparatus shall be thoroughly inspected by the factory. This inspection shall include road testing by the factory of no less than 100 miles. During the factory inspections and road testing, a checklist shall be utilized by factory personnel to document the inspection and road test results. The checklist shall include:

- Documentation of the make, model and serial numbers of all major components such as the engine, transmission, pump, axles, etc.
- Complete, comprehensive operational check of all chassis/drive train components and fluid levels.
- A comprehensive review of the entire exterior and interior of the apparatus for fit and finish, checked against the customer's pre-construction meeting approval specifications, and any ensuing change orders.
- A thorough test of all driving systems under actual highway and city driving conditions, for no less than 100 miles.

Y\_\_N\_\_

## DELIVERY

The fire apparatus shall be delivered over the road and under its own power to insure proper break-in of all driving components while still under warranty. Rail or truck freight shipment of the apparatus is not acceptable.

Y\_\_N\_\_

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## FAMILIARIZATION

An experienced and qualified distributor or sales representative shall familiarize Fire Department personnel (as designated by the authority in charge) in the proper operation, care and maintenance of the apparatus delivered.

The representative must be a qualified, trained agent of the local authorized distributor or sales representative, or a direct employee of the manufacturer of the apparatus.

A factory field service technician shall provide instruction to the Fire Department regarding the aerial device. The familiarization period shall consist of up to three (3) daytime sessions over a period of three (3) days during the normal work week (Monday - Friday). The number, length and time of the sessions may vary due to the nature of the apparatus and availability of attendees and must be approved by the factory in advance. Evening sessions may be arranged in advance with the Fire Apparatus Service Department under special circumstances. Due to scheduling, advance notice must be received in writing at least three (3) weeks prior to shipment or date of instruction and will be considered on a first come, first serve basis. The balance of any time remaining in a session may be devoted to minor adjustments or corrections to the apparatus for items which may have developed while in transit from the factory.

Y\_\_N\_\_

## DOCUMENTATION - NFPA REQUIREMENTS

All NFPA required documentation and certifications shall be supplied with the apparatus at the time of delivery.

Y\_\_N\_\_

## GENERAL DESIGN REQUIREMENTS

The design and layout of the apparatus specified herein has been carefully selected to meet the needs of the purchaser. Because the purchaser is buying a custom fire apparatus, it is expected that all bidders can provide and shall adhere to the details specified herein.

The specified apparatus shall be a custom cab type, designed and manufactured specifically for the fire service in North America. Modification of a conventional or commercial chassis is unacceptable. The apparatus shall meet or exceed the requirements of the NFPA 1901, current edition, in all respects. The chassis shall be the bidder's "top of the line" deluxe custom model incorporating an all steel cab for strength, durability and safety. The cab and body sheet metal shall be constructed of stainless steel, no exception.

The purchaser requires a cab that is structurally sound and has the structural integrity to provide protection to properly seat belted firefighters in the event of a rollover, impact with a heavy object or collision. The specified apparatus shall be designed to be fully operational in the local climate of the purchaser.

Y\_\_N\_\_

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## GROSS VEHICLE WEIGHT

The manufacturer shall be responsible for proper weight distribution upon the chassis and axles.

The apparatus when loaded, shall have not less than 25% nor more than 45% of the weight on the front axle and not less than 55% nor more than 75% on the rear axle. The successful bidder shall furnish a certified weight certificate showing weights on front axle, rear axle and total weight for the completed apparatus at time of delivery, with water and fuel tanks full, but without personnel, equipment and hose.

In accordance with NFPA 1901, it shall be the responsibility of the purchaser to notify the manufacturer in the purchaser's specification of any hose, ground ladders, or equipment to be carried by the apparatus that exceeds the minimum requirements of the NFPA 1901 standard in effect at the time of the bid.

Y\_\_N\_\_

## IN-SERVICE WEIGHT CALCULATION

The successful bidder shall furnish a weight calculation showing weights on the front axle, rear axle and total weight for the completed apparatus as specified by the purchaser, with water and fuel tanks full, equipment and hose. This calculation shall be available for the pre-construction conference.

For the purpose of calculating the in-service weight, firefighter weight shall be calculated at 250 pounds per crew member, including SCBA. If a hose load is not provided, the minimum hose load required by NFPA 1901 shall be used for the calculation. If a loose equipment load is not provided, including its location on the vehicle, the NFPA 1901 load amount based on the cube of the body shall be used.

Y\_\_N\_\_

## VEHICLE PERFORMANCE ANALYSIS

A performance analysis report shall be run on the vehicle, as ordered, using computer software to determine top speed, gradeability, optimum shift points and acceleration on various grades. The report shall be delivered with the completed vehicle, but shall be available within thirty (30) days of the pre-construction conference.

Y\_\_N\_\_

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## GENERAL CONSTRUCTION, QUALITY AND WORKMANSHIP

The design and construction of the apparatus shall embody standard automotive heavy vehicle engineering practices. The apparatus shall be designed, engineered and constructed with due consideration for the severe service nature of the fire service. All parts of the apparatus shall be installed in accordance with the OEM specifications and shall be strong enough to withstand the general service under full load for a minimum of twenty (20) years.

Distribution of load between the front and rear axles shall be engineered so that all specified equipment, including a filled water tank, full complement of personnel and fire hose shall be carried without damage to the apparatus. Weight balance and distribution shall be in accordance with the recommendations of the National Fire Protection Association and current standard automotive practices.

The workmanship shall be of the highest quality in its respective field. In order to assure the quality that the purchaser demands and expects, all welding personnel that shall be utilized in the fabrication and construction of structural components of the apparatus chassis, body and aerial device shall hold a valid certificate from the AWS - American Welding Society.

The apparatus shall be designed to conform to the intent of ANSI and NFPA 1901 standards. The following design criteria shall be applicable to this specification to the extent specified herein:

- American Society for Testing Materials (ASTM) - A-36, Specification for Structural Steel
- Society of Automotive Engineers, Inc. (SAE) - SAE Handbook
- American Welding Society (AWS) - AWSO14.4-77 Classification and Application of Welded Joints for Machinery and Equipment
- American Society for Non-Destructive Testing (ASNT)
- ASNT Guidelines; Procedure SNT-TC-1A

The apparatus shall have symmetrical proportions and a pleasing appearance as a result of design detail and fit/finish quality. The apparatus shall be engineered with firefighter safety as the top priority. Ease of operation and ease of maintenance shall also be considered in the apparatus design, but shall not compromise safety. No special tools shall be required to access normal service or maintenance items.

All sensitive components shall be protected against adverse weather conditions. Any exposed metal surface which is not painted or otherwise coated shall have a bright finish. Corrosion protection shall be provided between any dissimilar metals joined in the construction of this apparatus.

Y\_\_N\_\_

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## STEPPING SURFACE CERTIFICATION

The manufacturer shall provide at time of delivery of the apparatus, a certification that all materials used for exterior surfaces designated as stepping, standing and walking areas, all interior steps and all interior floors meet the slip resistance requirements of the applicable edition and section of NFPA 1901.

Y\_\_N\_\_

## TOWER TEST AND CERTIFICATION

The tower shall be third party tested at the manufacturer's facility and shall conform to NFPA requirements and standards. Copies of all tests shall be provided with the delivery documentation.

Y\_\_N\_\_

## PERFORMANCE REQUIREMENTS AND TEST - NFPA

A road test shall be conducted with the apparatus loaded per NFPA recommendations (unless otherwise specified) and a continuous run of ten (10) miles or more shall be made 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.

The apparatus must 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.

The fully loaded vehicle shall be capable of obtaining a minimum top speed of 50 mph on a level concrete highway with the engine not exceeding its governed rpm (full load).

The apparatus shall be able to maintain a speed of 20 mph on any grade up to and including 6%.

The service brakes shall be capable of stopping the fully loaded vehicle in 35 feet at 20 mph on a level concrete highway.

The apparatus shall be tested and approved in accordance with NFPA standard practices.

Y\_\_N\_\_

## FAILURE TO MEET TEST

In the event that the apparatus fails to meet the road test requirements of these specifications upon delivery, during the first trials, second trials may be made at the option of the bidder within 30 days of the date of the first trials. Such trials shall be final and conclusive and failure to comply with these requirements shall be cause for rejection of the apparatus. Permission from the manufacturer to keep or store the apparatus in any building owned or occupied by the purchaser or its use by the Fire Department during the above specified period shall not constitute acceptance.

Y\_\_N\_\_

## GENERAL

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Chassis shall be a new, heavy duty, custom fire apparatus design built expressly for the fire service. All standard components that have not been specified shall be provided.

Chassis shall be designed, engineered and built by the bidder and be the manufacturer's first line custom chassis.

The chassis shall be suitable for heavy duty service with all components having adequate strength and capacity for the intended load to be sustained and the type of service required.

Y\_\_N\_\_

## SEATING CAPACITY

The safe seating capacity of the cab for properly belted passengers shall be: Four (4)

Y\_\_N\_\_

## APPROACH - DEPARTURE ANGLES

An angle of approach and an angle of departure of at least 8 degrees shall be maintained at the front and the rear of the vehicle when it is loaded to the estimated in-service weight, as defined by NFPA 1901 2009 edition.

Y\_\_N\_\_

## GROSS VEHICLE WEIGHT RATINGS

Front Vehicle Weight Rating shall be: 22,800 Lbs.

Rear Vehicle Weight Rating shall be: 58,000 Lbs.

Gross Vehicle Weight Rating shall be: 80,800 Lbs.

Y\_\_N\_\_

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## FRAME

The frame is to be specifically designed and produced for the vehicle as specified. Each hole made in the frame rails must be used for a specific chassis component and any holes for non-required options are not acceptable.

The chassis frame shall be built using two variable section steel channels and a minimum of six (6) formed steel crossmembers. The frame rails shall be 120,000 psi heat treated steel alloy of 0.375" material thickness and measuring 13.5" deep, tapering to 11.0" deep at forward and rearward ends with continuous 3.75" wide top and bottom flanges. The crossmembers shall be of heavy duty, fabricated, all-welded design, made out of a minimum of 50,000 psi material.

A full length "C" straight channel frame innerliner of 0.375" thickness and measuring 10.25" deep with 3.40" wide top and bottom flanges shall be provided.

At the narrow rail section, each rail shall have a combined minimum section modulus of 39.44 and a combined minimum resisting bending moment of 4,413,538 inch pounds.

At the deep rail section, each rail shall have a maximum section modulus of 46.26 at the 13.5" depth portion, which shall provide a resisting bending moment of 5,551,200 inch pounds.

The frame rails and cross members shall be assembled using 5/8" flange head, grade eight bolts and "Spiralock" flanged nuts. Spiralock nuts shall be used exclusively in the frame assembly for mounting spring hangers, steering gear, engine, transmission, etc. to maintain constant torque tension and prevent loosening from vibration. Spiralock nuts shall provide even thread load over the bolt, increasing fatigue strength and clamping torque.

The frame rails shall be primed with a polyester powder coating.

Y\_\_N\_\_

## BUMPER

A heavy duty 10.25" high 1/4" thick painted steel bumper shall be mounted to the front of the chassis. It shall be fabricated in the factory of the bidder. Bumper shall be channel shaped with 2-1/4" flanges.

As part of the bumper extension, a second 1/4" thick by 9.44" high formed channel with 2" flanges shall be provided directly behind the full width of the bumper. The bumper extension support shall be of channel (minimum 9-7/16" x 3" x 3/8") construction, bolted to the chassis frame. A 3/16" aluminum treadplate gravel pan (deck) contoured to fit just below the front face of the cab and just below the upper bumper flange shall be provided. Sides (between bumper and cab corners) of the deck shall be boxed in and tapered up to meet bottom of front cab face. Pan shall not be fastened to the top flange of the bumper.

Y\_\_N\_\_

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## 18" BUMPER EXTENSION

A bumper extension shall be installed at the front of the cab. The front of the bumper shall be approximately 18" from the front face of the cab. A gravel pan made of 3/16" aluminum treadplate shall be installed between the front bumper and the cab. The bumper extension shall be designed and constructed so that the apparatus can be pulled by the extension.

Y\_\_N\_\_

## LIFTABLE AND TOWABLE BUMPER EXTENSION

The bumper extension shall be designed and constructed so that the apparatus can be lifted and towed by the extension. The bumper extensions shall be constructed with a heavy duty structure so as to allow the gravel pan to support weight and additional options.

Y\_\_N\_\_

## FRONT TOW EYES

Two (2) painted "cut plate" type tow eyes shall be furnished. They shall be installed through the front face of the bumper and securely attached (bolted) to the bumper extension frame. The eyes shall be fabricated of 1" thick steel plate with a 3" diameter opening.

Y\_\_N\_\_

## REAR TOW EYES

Two (2) rear tow eyes, bolted to the frame rails, one (1) each side shall be provided. The eyes shall be fabricated of 1" heavy duty steel plate, with a 3" diameter opening designed so that stress will be applied to each chassis frame rail, when utilized.

Y\_\_N\_\_

## STEERING

A Ross model TAS-85 integral heavy duty power steering system or equivalent shall be provided. The hydraulic pump shall be engine gear driven. The steering gear "box", or fixture that the gear is mounted to, shall be fabricated in the factory of the bidder. It shall be a welded assembly constructed of 3/8" formed steel with a 3/4" face plate. Vertical gussets shall be provided between the face plate and the frame mounting plate to insure against frame flex while the vehicle is stationary.

Y\_\_N\_\_

## AUXILIARY CYLINDER FOR POWER STEERING

An auxiliary power assist cylinder shall be provided in the power steering system.

Y\_\_N\_\_

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## CHASSIS ALIGNMENT

The chassis frame rails shall be cross checked for length and square. Front and rear axles shall be laser aligned. The front axle shall be aligned and toe-in and caster set on the front tires at the manufacturer's facility.

The completed apparatus should be rechecked for proper alignment after the chassis has been fully loaded.

Y\_\_N\_\_

## AIR PIPING

The service brake system shall be full air type. The system is to meet or exceed current FMVSS-121 requirements. Other components or accessories shall be as follows or equivalent:

Pressure protection valve

Quick build up system

Engine mounted, gear driven air compressor

Bendix Model E-6 dual circuit brake treadle valve

Two (2) air pressure gauges on cab dash with indicator light and buzzer

One (1) Bendix DV2 automatic drain valve on wet tank

Manual drain valves on remaining air reservoirs

Air reservoirs

The Bendix SR-7 valve, in conjunction with the double check valve, shall enable modulation of the spring brakes in the event of a service brake air system failure to allow the vehicle to be stopped.

Brake piping shall consist of SAE approved, DOT rated "Synflex" reinforced colored nylon tubing. The lines shall be wrapped in a heat protective loom where necessary in the chassis. Braided hoses shall provide flexibility between axle and frame connections. Brake air lines shall be color-coded. Air inlet to air brake compressor shall be from the engine intake manifold, i.e. after transition through the engine air cleaner. A stainless braided Teflon hose shall be provided from the compressor to the air dryer.

The parking brake system is to be the spring set type operated by control valve on driver's console. A brake indicator light shall also be provided.

Y\_\_N\_\_

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## ADDITIONAL AIR RESERVOIR

One (1) additional 1770 cubic inch air reservoir(s) shall be provided and installed. Each extra reservoir shall be isolated and be plumbed with a pressure protection valve on the reservoir supply side.

Tank shall be used for increase system capacity.

Y\_\_N\_\_

## AIR DRYER

A Meritor WABCO 1200 System Saver air dryer or equivalent shall be installed in the air brake system. It shall have a minimum capacity of 30 cfm air flow. Dryer shall be equipped with an integral, automatic, 12 volt heated moisture ejector which is thermostatically controlled. System shall include a pressure controlled check valve installed between the wet tank and the secondary air reservoir.

Y\_\_N\_\_

## AUXILIARY AIR INLET

There shall be an auxiliary air inlet installed to maintain the chassis air pressure while the engine is not running. A check valve shall be installed in the line to prevent outflow of air pressure from the "wet" or "supply" tank.

Location of Auxiliary Air Inlet shall be on the front of the driver's step well.

Y\_\_N\_\_

## FRONT AXLE

A Meritor MFS front axle with a 22,800 pound rating shall be provided or equivalent. It shall include composite low-friction bushings with diagonal grooves to better distribute lube, camber settings of +1/4 degree for both left and right sides to help improve tire life and a large diameter, heat treated kingpin with a lube retaining seal.

Y\_\_N\_\_

## DISC BRAKES

The front axle shall be provided with Meritor #EX225H air disc brakes or equivalent with internal automatic adjustment, sealed synchronized twin pistons and robust sealing of slide pins for environmental protection. The #EX225H air disc brakes shall have 17" rotors and a fully sealed lever mechanism with variable mechanical ratio. A visual indicator of brake wear shall also be provided.

Y\_\_N\_\_

## FRONT SEMI-ELLIPTICAL SPRING SUSPENSION, 4" X 52"

The front suspension shall be semi-elliptical 4" x 52" constant rate type springs with a military

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wrapped eye. The correct material, spring length, width, thickness and number shall be provided to match the leaf spring rating with that of the gross axle weight rating of the vehicle.

## SHOCK ABSORBERS

Gabriel heavy-duty telescoping shock absorbers or equivalent shall also be provided on the front axle.

Y\_\_N\_\_

## WARRANTY

Meritor Corporation or equivalent provides a two (2) year parts and labor warranty on the front axle.

Y\_\_N\_\_

## WARRANTY

Meritor Corporation or equivalent provides a three (3) year parts and labor warranty on the EX225H disc brakes.

Y\_\_N\_\_

## AUXILIARY AIR APPLIED FRONT AXLE PARKING BRAKE

An auxiliary air applied front axle parking brake shall be supplied with a separate control switch and properly labeled indicator light in the cab. This front parking brake will only be able to be activated when the parking brake for the rear axle is set.

Y\_\_N\_\_

## REAR AXLE

The rear single or tandem drive axle shall be a Dana model D/R60-190 with a capacity of 60,000 pounds at the hub or equivalent. Each rear axle shall include Bendix 16 1/2" x 7" S-Cam brakes with dust shields and automatic slack adjusters or equivalent. Stroke indicators shall be incorporated to provide a visual indicator of brake wear.

An inter-axle differential control switch shall be provided on the cab dash, easily accessible from the driver's seating position.

All axles shall be purchased complete from and certified by the axle manufacturer for the specific application. Brake chamber brand and size shall be determined by the axle manufacturer.

Y\_\_N\_\_

## ROAD SPEED

Per NFPA, the maximum top road speed shall be 60 mph at the governed engine RPM..

Y\_\_N\_\_

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## ANTI-LOCK BRAKING SYSTEM (ABS)

The vehicle shall be equipped with a WABCO 6S6M or equivalent anti-lock braking system (ABS). The ABS shall provide six (6) channel anti-lock-up braking control on the (2) front and (4) rear wheels. The system shall employ a digital electronics system with microprocessor controls divided into two (2) diagonal circuits. In the event of one circuit malfunction the second circuit shall operate unaffected. Each wheel shall be constantly monitored by the system when the vehicle is in motion. When any wheel begins to lock-up during braking, a signal shall be transmitted to the processor from the wheel sensor. The control unit shall instantly reduce the braking force applied to the wheel and immediately re-apply braking force so that the wheel rapidly slows without locking. The system shall control all wheels simultaneously to provide maximum vehicle braking in a relatively straight line.

An ABS warning light shall be installed in the warning light panel of the driver's dash.

The ABS system shall automatically disengage the auxiliary braking system whenever the anti-lock braking mode is active.

Y\_\_N\_\_

## INTER-AXLE DIFFERENTIAL LOCK

If fitted with rear tandem axle set, it shall be equipped with an air actuated primary traction device that allows for speed differences between the forward and rear tandem axles while providing equal pulling power from each axle. When disengaged, one wheel set of the forward drive axle and the opposite side wheel set of the rear drive axle shall operate in drive action to minimize wear on drive components. When the IAD lock is engaged, both wheel sets of each tandem axle provides drive action and does so until one side encounters slip or the vehicle is turning, thereby maximizing traction without diminishing turn radius.

A dash mounted rocker switch shall engage and disengage the IAD lock. While the IAD lock may be engaged or disengaged at rest or at road speed, it should not be engaged whenever any drive wheel is slipping.

It is understood that the IAD should be unlocked for normal dry road condition operation to avoid premature ring gear, clutch and tire wear.

Y\_\_N\_\_

## WARRANTY

Dana Corporation or equivalent provides a five (5) year parts and labor warranty on the rear axle.

Y\_\_N\_\_

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## VEHICLE STABILITY COMPLIANCE – ELECTRONIC CONTROL

In compliance with NFPA 1901-2009 Edition standard 4.13.1, the vehicle, as specified, shall be equipped with a Meritor-WABCO or equivalent electronic Roll Stability Control system that shall utilize a cab mounted tipping sensor and steering shaft position sensor interacting with the chassis' ABS traction control, auxiliary braking system and the engine ECM to minimize the vehicle's potential for rollover in a turning at speed maneuver.

Y\_\_N\_\_

## AUTOMATIC TRACTION CONTROL WITH DEEP SNOW AND MUD SWITCH

Automatic Traction Control, working in concert with the ABS system, shall be provided which shall reduce wheel slip on acceleration on wet or slippery road conditions. A light shall illuminate on the driver's dash when the drive wheels slip during acceleration.

A deep snow and mud option switch shall be provided in addition to the ATC option. This function increases available traction on extra soft surfaces like snow, mud or gravel by slightly increasing the permissible wheel spin.

Y\_\_N\_\_

## VOGEL LUBRICATION SYSTEM

The auto lube system shall provide automatic grease application up to 34 designated wear points on the unit, with the recommended dosages, per system interval cycle.

The auto lube system shall be powered by an electrically driven Gear Pump. The gear pump shall be top mounted to a reservoir assembly with a capacity of 2.7 liters. The pump shall operate against a back pressure of 38 BAR (550 PSI) nominal, with an output of 160 cc/min. The pump assembly shall be mounted in a suitable location to facilitate care and maintenance of the system by removal of the cover assembly for access to the refill valve connection for replenishment of the grease reservoir.

Distribution of lubricant shall be via Piston Distributors utilizing the "post lubrication principle", dispensing lubricant on the off cycle of the system or pump run time, with metering nipples bearing dosage identification which can be field changeable without disruption of other lubrication point connections.

The auto lube system shall be operated via an electronic control module with System Monitoring capabilities of the main line and operating cycle with dash mounted visual indication to the vehicle operator. The control module shall have LED's and a system reset button to initiate a lube cycle for diagnostic purposes and/or reset the control module in the event a system fault has occurred. Upon a fault, the system is inoperable until the fault has been corrected and a system reset has been initiated by the operator or serviceman.

Y\_\_N\_\_

Y\_\_N\_\_

## DRUM PUMP FOR VOGEL AUTOMATIC LUBE SYSTEM

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A drum pump shall be provided to assist in refilling the Vogel System reservoir.

Y\_\_N\_\_

## 35 LB. TUB OF GREASE FOR VOGEL LUBE SYSTEM

A 35# tub of grease, (5-gallons), shall be provided.

Y\_\_N\_\_

## REAR SUSPENSION

The rear suspension shall be a Hendrickson HN-582 or equivalent. It shall include a VariRate rubber spring system that shall increase stability and unloaded ride quality. It shall be virtually maintenance free with no center bushings.

Y\_\_N\_\_

## FRONT TIRES

The two (2) front tires shall be Michelin 425/65R22.5, XFE, load range "L", regional tread (medium to heavy loads, frequently on 2-lane roads) with a maximum rating of 12,200 pounds at a top speed of 75 mph.

Y\_\_N\_\_

## REAR TIRES

The eight (8) rear tires shall be Michelin 315/80R22.5, XDN2 Grip, load range "L", neige tread (radial tire designed for great traction and good mileage) with a maximum rating of 8,270 pounds at a top speed of 75 mph.

Y\_\_N\_\_

## WHEELS

Wheels shall be steel disc type and hub piloted. Wheels shall be painted job color. Chrome plated nut covers shall be furnished.

Y\_\_N\_\_

## TIRE PRESSURE INDICATORS

Accu-Pressure Heavy Duty Safety Caps shall be provided and installed: each wheel shall be equipped with a valve stem inflation pressure sensitive monitor that shall provide a visual color indication of when the tire pressure is below the manufacturers recommended level. The chrome safety cap shall show green when the tire is properly inflated and red once the tire becomes underinflated.

Y\_\_N\_\_

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## TIRE BALANCE

EQUAL Tire Performance Balancing Compound shall be inserted into the front tires to balance and maintain a vibration-free rotation.

Y\_\_\_N\_\_\_

## ENGINE

The chassis shall be powered by a 2013 emissions compliant Cummins ISX12 diesel engine, as described below:

Model	ISX12
Number of Cylinders	Six
Bore and Stroke	5.11 x 5.91 in
Displacement Liter (Cu. In.)	11.9 (729)
Rated BHP	500 @ 1800 RPM
Torque	1645 ft.lb. @ 1200 RPM
Governed RPM	2100
Oil Capacity / Type	12 gallons / SAE CJ-4
Fuel Requirement	Ultra low sulfur diesel (15 ppm max.)

Standard equipment on the engine shall include the following:

- Selective Catalytic Reduction (SCR) after treatment
- Cooled Exhaust Gas Recirculation system
- Fan – 32”, 11 blade
- Charge air cooling
- High pressure, common rail fuel system
- Fuel filter with check valve and water separator
- Fuel strainer
- Governor – electronic, interact system
- Injectors – electronically controlled full authority injection
- Lube oil cooler – integral
- Lube oil filter – full flow

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Turbocharger – variable geometry type

Air compressor – Wabco 18.7 CFM

The engine exhaust system shall be a horizontal design constructed from heavy-duty truck components. Flexible couplings shall be utilized to absorb the torque and vibration of the engine. The outlet shall be directed to the forward side of the rear wheels, exiting the right side, with a straight tip. A heat-absorbing sleeve shall be used on the exhaust pipe in the engine compartment area to reduce stored heat, providing protection for the alternator, and also to protect hands when checking or adding oil in the engine compartment.

Y\_\_N\_\_

## ENGINE AND CHARGED AIR COOLING SYSTEMS

A serpentine core type radiator with continuous louvered copper fin design shall be provided. Radiator shall be fitted with formed steel side frames. The top tank shall have a built-in de-aeration system. A drain shall be located at the lowest point.

The engine charged air heat exchanger shall be located directly in front of the radiator and be bolted to its side rails. It shall be all aluminum-brazed construction. Air cooler shall be cross flow design with cast aluminum side tanks, horizontal inlet and outlet at top and aluminum louvered serpentine external air fins. Plastic tanks shall not be acceptable, no exceptions. Cooler tubers shall also be constructed of aluminum and have internal fins that eliminate laminar airflow.

The charge air cooler and the radiator shall be produced by the same manufacturer as a single assembly to provided continuity throughout the cooling system. This shall ensure a certified “balanced” package for the chassis engine air and fluid cooling systems.

The radiator and charger cooler shall be mounted to the chassis stub. Fabricated mounting bracket for the fans ring shall be attached to the front of the engine in a manner so that it “floats” with the engine and increases the fan’s efficiency by tightening the tip clearance. This mounting design eliminates engine fan and radiator shroud contact due to engine torque movement and promotes more efficient airflow. The radiator and charger cooler shall be held in place at the bottom by two (2) large bolts equipped with anti-stress rubber biscuits. The top of the radiator shall be supported by two (2). ¾” tubular braces, bolted to the chassis stub. Anti-vibration rubber biscuits shall be installed at the top threaded end of the braces where they attach to the radiator.

Y\_\_N\_\_

## ENGINE COOLING CERTIFICATION

"EPQ" (End Product Questionnaire) certification shall be provided by the apparatus manufacturer and shall be done on a completed unit (after pump and complete body installation). Incomplete certifications (chassis only) shall not be acceptable.

Y\_\_N\_\_

## FUEL WATER SEPARATOR WITH ALARM & HEATER

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A Racor 490 spin-on 10 micron filter with fuel water separator with water sensor alarm and heater shall be provided.

Y\_\_N\_\_

## ENGINE STARTER

A Denso, 12 volt, 5.0 kW gear reduction starter shall be installed.

Y\_\_N\_\_

## AIR COMPRESSOR

A Wabco 18.7 cfm air compressor shall be furnished. The air compressor shall be gear driven off the engine.

Y\_\_N\_\_

## WARRANTY

Cummins provides a 5 year or 100,000 mile warranty on the ISX12 engine.

Y\_\_N\_\_

## FAN CLUTCH

A pneumatically operated, thermostatically controlled, clutch shall be provided for the engine cooling fan. The clutch shall be of a failsafe design, in that it shall fail in the "on" mode and thus prevent overheating in the event of component or air line failure. Manufacturer shall also wire the clutch so that it remains "on" in the pumping mode to prevent water pressure fluctuations.

Y\_\_N\_\_

## COOLANT OVERFLOW RESERVOIR

A six (6) quart coolant overflow reservoir shall be provided. It shall be located in the engine compartment.

Y\_\_N\_\_

## SILICONE HOSES

All hoses in the cooling system shall be silicone type with stainless steel constant torque Oetiker clamps.

Y\_\_N\_\_

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## TRANSMISSION

An Allison, Model 4000 - EVS, electronically controlled, 5 speed automatic transmission with integral fluid filter shall be provided. A transmission cooler shall be installed in the radiator bottom tank. A warning light and buzzer shall be provided on the cab dash to alert the driver should the transmission overheat.

The transmission shall include the following: an oil life monitor, a filter life monitor, and a transmission health monitor. The oil life monitor determines fluid life remaining by monitoring various operating parameters. The filter life monitor determines when fluid filter(s) need to be replaced. The transmission health monitor determines when clutch system inspection is required. The monitors send a message via a blink code to a special prognostic light on the shift pad. Also on the shift pad shall be installed a digital, double-digit display that identifies the level of transmission oil. The display shall identify the oil level as "Ok", "Lo" or "Hi", also indicating the number of quarts lo or hi.

The transmission shall include the following emergency vehicle specifications:

Maximum gross input power:	600 hp
Maximum gross input torque:	1850 ft.lb.
Input speed range:	1700 to 2300 rpm
Direct gear lock-up:	4 <sup>th</sup> @ 1.00 to 1.00
Overdrive gear and ratio:	5 <sup>th</sup> @ 0.74 to 1.00

Gear ratios shall be as follows:

1 <sup>st</sup>	3.51 to 1
2 <sup>nd</sup>	1.91 to 1
3 <sup>rd</sup>	1.43 to 1
4 <sup>th</sup>	1.00 to 1
5 <sup>th</sup>	0.74 to 1
Rev	-4.80 to 1

The transmission shall automatically shift into neutral whenever the chassis parking brake is applied.

Y\_\_N\_\_

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## TRANSMISSION FLUID

The Allison 4000-EVS transmission shall be delivered from the factory with a synthetic SAE standard ATF.

Y\_\_N\_\_

## TOUCH PAD TRANSMISSION SHIFT CONTROL

Touch pad control shift module shall be mounted to the right of the driver on the console and be indirect lighted for after dark operation.

Y\_\_N\_\_

## WARRANTY

Allison provides a 5 year warranty on the EVS transmissions.

Y\_\_N\_\_

## TRANSMISSION PROGRAMMING

The transmission shall be programmed as a 6-speed with 6th gear (second overdrive) selected by mode button only.

Y\_\_N\_\_

## DRIVELINE

Drivelines shall be built with heavy-duty metal tubes and utilize Spicer 1810 series or "Equal" mechanics type universal joints with "half round" end yokes. This quick disconnect strap and bolt design type end joint shall allow the driveline to be easily disassembled and dropped straight down for ease of service and maintenance. They also shall be dynamically balanced by the truck manufacturer before installation in the chassis. A splined slip joint is to be provided in each shaft assembly.

Y\_\_N\_\_

## FUEL SYSTEM

The vehicle shall be furnished with a 85 gallon fuel tank mounted behind the rear axle and just below the frame rails using steel rods and cradle. The tank shall be constructed of stainless steel and equipped with a swash partition and vent. The fuel tank shall meet all FHWA requirements and all DOT and FMVSS regulations for rollover protection. A 2" diameter fill inlet shall be provided. The fuel cap shall be of brass or bronze construction, non-vented and have lead safety fuses. It shall be chained to inlet tube or to the body sheet metal to prevent loss. Braided hoses shall be provided for the fuel lines. A 1/2" NPT drain plug shall be located at the bottom of the tank.

The fuel fill inlet shall be located on the left (drivers) side of the apparatus in the step well cavity. It shall be concealed behind a door marked "ULTRA LOW SULFUR DIESEL FUEL ONLY". The fuel inlet area, recessed behind the door, shall be completely enclosed to prevent dirt and

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debris from entering. Provision shall be provided inside the fill recess for drainage of any spilled fuel within the cavity.

The fuel door shall be constructed of stainless steel and shall have a brushed finish. It shall be hinged on the left side. A spring loaded device with brass roller shall be provided to hold the door in the open or closed position. A black pull knob shall be installed on the door for opening and closing it.

Y\_\_N\_\_

## ALTERNATOR

A 420 amp Delco alternator, model 55SI, shall be provided.

Y\_\_N\_\_

## AIR CLEANER

A Donaldson Power Core dry type engine air cleaner shall be provided. It shall be installed in a location so that the filter element can be easily serviced.

Y\_\_N\_\_

## AIR RESTRICTION INDICATOR IN INFORMATION DISPLAY CENTER

An electrical engine air restriction indicator shall be provided and installed in the cab information display center.

Y\_\_N\_\_

## EXHAUST

A SCR chamber shall be installed in “stacked” series with the DPF chamber on the right side of the vehicle, immediately behind the cab and shall ingest urea from a remote storage tank providing a catalytic reaction with diesel exhaust particulates. The exhaust assembly shall be mounted outboard of the frame rail.

Y\_\_N\_\_

## MUFFLER COVER

A brushed stainless steel cover shall be installed over the outboard face of the muffler. This cover shall not be a structural component, but shall dress up the appearance of the muffler. The cover shall be provided with perforated slots.

Y\_\_N\_\_

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## DEF & DEF ACCESS

The urea mixture, a solution of 2/3 water and 1/3 urea which reacts with NOx to create nitrogen and water, shall be stored in a 10 gallon tank equipped with a level sensor and alarm to prevent run-out. The urea tank shall be accessed by tilting the cab.

One (1) tank full of urea solution shall be required for every 500 gallons of diesel fluid.

Y\_\_N\_\_

## TAILPIPE EXTENSION

The tailpipe shall be provided to accommodate a Plymovent exhaust evacuation system. The tailpipe will be mounted perpendicular to the side of the truck and be flush with the body. 12" of clearance between the pipe and the tire will be provided.

It is understood that the 2007 engine exhausts can not be connected to exhaust evacuation systems when the Diesel Oxidation Catalyst and Diesel Particulate Filter on the engine are regenerating.

Tailpipe mounting shall be straight out from the body

Y\_\_N\_\_

## EXHAUST HEAT SHIELDS

Heat shields shall be provided as needed to prevent damage to body and wiring from excessive exhaust temperatures. The exhaust pipe shall be wrapped in multi-layered insulation blankets, from just aft of the turbo down to inlet side of the DPF. Each blanket shall have a fiberglass inner layer and a silicone impregnated fiberglass cloth outer layer

The cab shall receive 1.25" thick foil back insulation blanket under the crew floor to reduce floor temperatures.

All harnesses and cables, in proximity to exhaust system components, shall be protected with insulation.

Y\_\_N\_\_

## ENGINE BRAKE

A Jacobs engine brake shall be installed with controls within easy reach of the driver. Brake shall automatically be actuated when the accelerator pedal is released. The engine brake shall be wired in conjunction with the rear brake lights so that they are activated when the engine brake is engaged. It shall have a three position switch; "LOW", "MEDIUM" and "HIGH" along with an "OFF" and "ON" switch.

Y\_\_N\_\_

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## FAST IDLE SWITCH

A fast idle switch shall activate an engine high idle. The circuit shall be wired through the neutral safety/parking brake interlock to prevent activation when the transmission is in the road mode. Fast idle shall be set at 1000 RPM's. A switch located inside the cab convenient to the driver shall be provided for this system.

Y\_\_N\_\_

## LUBRICATION DECAL

A decal shall be installed on the interior face of the driver's door near the hinge. The decal shall specify the quantity and type of lubrication fluids used in the following chassis or apparatus components: engine, chassis transmission, pump transmission, pump primer and rear axle differential. Engine coolant type and quantity shall also be stated.

Y\_\_N\_\_

## STAINLESS STEEL FULL TILT CAB

The cab shall be designed specifically for the fire service and shall provide roll cage strength and safety. The cab shall be made in the factory of the bidder and must be the bidder's top-of-the-line stainless steel model. The cab shall tilt forward 45 degrees for engine access. In order to provide the strongest, safest cab design possible, no extrusions shall be used in the construction of the cab structure. No plastic or fiberglass shall be used in the construction of the cab sub-frame, floor assembly, front assembly, side assemblies, back wall assemblies or roof assembly.

Y\_\_N\_\_

## CAB DIMENSIONS

The back wall of the cab shall measure 62" from the center of the front axle. The cab shall have an inside width of 91" and outside width of 96". Entrance step wells to the driver's and officer's positions shall be a minimum of 26" wide and the rear crew step wells shall be 26" wide. They shall be "spaced" out at front, rear and side to prevent trapping of dirt and other residue. Entrance steps shall be made of expanded aluminum grating.

Y\_\_N\_\_

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## CUSTOM CAB DESIGN AND CONSTRUCTION

### SUB-FRAME

The sub-frame shall be stainless steel reinforced welded safety-cage construction utilizing a 3" x 4" rectangular structural steel tube sub-frame, with 4" stainless steel tubing used for vertical cage members. All joints shall have continuous welds; stitch welding shall not be acceptable. The sub-frame shall be designed as a one-piece structure from the front to the back of the cab. It shall be used to support the cab while tilting, join front pivots to the cab locks, and to join the cab to the chassis. Pocketing of the sub-frame shall not be acceptable. Use of the engine tunnel as part of the main sub-frame shall not be acceptable.

Y\_\_N\_\_

### CAB FLOORS

All floor components shall be welded directly to the sub-frame. The floor shall be constructed of 50,000 psi stainless steel. Cab floors shall be covered with a sound barrier mat with a heavy-duty wear surface.

Y\_\_N\_\_

### FRONT ASSEMBLY

The safety-cage section at the front of the cab shall be constructed of 1.25" stainless steel tubing and shall join the front door posts together with the main sub-frame. There shall be a 2.50" x 1.50" x .25" heavy wall lower cross tube that joins the cab sills together to prevent cab twisting when tilting the cab. The front fire walls shall be set back from the front assembly structure to provide added protection in a frontal crash. The outer cab skin shall not be an integral structural member, although it shall help stiffen the cab front face.

Y\_\_N\_\_

### SIDE WALL ASSEMBLIES AND DOORS

The safety-cage on the sides shall be constructed of 1.25" stainless steel tubing. Both side wall assemblies shall be joined to the sub-frame via thick tubular structures, using heavy fillet welds. This shall strengthen the walls to withstand high roof loading. The side wall outer skins shall be integral with the cab structure as well as additional formed components to help stiffen side wall assemblies. There shall be 1.25" of insulating foam between the exterior and interior side walls. The structure shall be reinforced for cab entry grab handle mountings.

The front door hinge mount (aka "A" pillar) shall be a 2" x 3" tube with a .19" thick wall. The rear door hinge mount (aka "C" pillar) shall be equivalent to a 12 gauge formed channel with .19" thick tapping bar.

Y\_\_N\_\_

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## BACK WALL ASSEMBLY

The safety-cage on the back wall shall be constructed of 1.25" stainless steel tubing. It shall join the roof to the floor assembly. Construction of the back wall assembly shall utilize a minimum of 12 gauge stainless steel material and the design shall provide crush protection in the event of a rollover. The back wall structure shall be uniform, regardless of the seating choices. All seat mounts and seatbelt mounts shall use weldnuts to eliminate pullouts and stripped threads. The outer skin shall not be an integral structural member, although it shall stiffen the back wall. One inch of insulating foam shall be located between the exterior and interior back walls.

Y\_\_N\_\_

## ROOF ASSEMBLY

The 1.25" stainless steel tubing used in the construction of the roof section of the safety-cage shall support 2 psi of loading across the whole roof. The fabricated and welded roof sills and front header shall be made of 50,000 psi stainless steel material. The corner caps shall utilize spun metal technology thus retaining the metal's strength while producing a very rigid corner joint. The side roof covering (rolled edges) shall be constructed of stainless steel formed in a quarter round. It shall form a hollow double wall, angle reinforced roof edge with an integral drip rail. The roof top outer wall shall not be an integral structural member, although it shall stiffen the roof. There shall be 1.25" of insulating foam between the exterior roof and interior ceiling.

Y\_\_N\_\_

## CAB TILT

The cab shall tilt a minimum of 45 degrees for normal servicing of the engine and other equipment. The tilt cab locking system shall be a two-point type that locks automatically when the cab is lowered into its nested position. The cab tilt package is custom designed for safety and ease of vehicle maintenance. The hydraulic tilting system consists of two (2) heavy-duty single acting cylinders equipped with velocity fuses at the cylinder base in case of any failure in the operating mode. The power supply is a high efficiency electric over hydraulic system with an integral mechanical override in case of battery failure. All components and parts are designed for installation with a minimum of 3 to 1 safety factor based on current S.A.E. standards.

In addition to the velocity fuses, a secondary safety system shall be provided to hold cab in the fully raised position in the event of a failure in the primary lift mechanism. It shall consist of a metal channel device, which automatically drops over the extended rod of the left side hydraulic lift cylinder thereby preventing its retraction. The safety channel can only be released through an overt action made by the operator such as pulling a lever or cable. Automatic release of the safety system shall not be acceptable.

The cab tilt system shall be remotely controlled utilizing a twelve foot cable with a hand held push button device which is to plug into a receptacle in the bumper area on the left-hand side of the cab. The receptacle shall have a spring-loaded weatherproof cover. A four point isolated mounting system shall be provided. The mounting system shall consist of two (2) front pivot mounts fabricated of steel and two (2) rear cab mounts that are center bonded rubber. Each front pivot mount shall consist of a greaseless pin and a multi-layered, self-lubricating, composite

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bearing. The outer layer of the bearing shall be high-durometer rubber to isolate road vibrations and shock.

Y\_\_N\_\_

## CAB DOOR CONSTRUCTION - BARRIER CLEARING

The cab doors shall be barrier clearing and fabricated from stainless steel (No exceptions). The cab doors shall be 34.75" wide. The interior and exterior door handles to be flush mounted paddle style with a keyed lock incorporated in the exterior handle and lever control lock incorporated in the interior handle. Six (6) inch wide strap style door checks shall be provided. The door check's straps shall have a tensile strength of 120 lbs/in of width. The door's latch locking mechanism shall make it impossible to lock oneself out of the cab unless locked with the supplied key. Doors shall be hung on stainless steel full length hinges attached to cab and door with .25" bolts. The hinges for each door shall be of one-piece 304-2B stainless steel construction with ¼ stainless steel pins and 0.090 gauge leaves with 2" joints and a 3" width opening. Doors shall meet Federal Motor Vehicle Safety Standard #206. The doors shall be designed so as to allow the windows to roll completely down.

Each cab door inner panel shall have a minimum of 96 square inches of reflective material installed to alert traffic when doors are open.

Y\_\_N\_\_

## INNER DOOR PANELS – LINE-X (4)

The upper inside bolt-on panel on each cab door shall be removable and shall be constructed of aluminum covered with Line-X.

All cab passenger compartment doors shall have at least 96 square inches of reflective material affixed to the inside of each door to alert traffic when the door is open. The reflective material shall be a chevron design that complies with NFPA requirements.

Y\_\_N\_\_

## ATP OVERLAY ON BACK OF CAB

An aluminum treadplate overlay shall be provided over the entire exterior rear wall of the cab.

Y\_\_N\_\_

## CAB GRILLE - VERTICAL BARS AND RAISED BEZEL SURROUND

The cab front opening shall be covered with a custom made polished stainless steel grille that shall be fabricated in the bidder's factory. The grille shall have formed vertical bars spaced apart on 2" centers. The upper polished stainless steel grille shall have a matching lower counterpart to further facilitate engine cooling. The two (2) stainless grilles shall be housed in a custom, raised and chrome plated bezel.

Y\_\_N\_\_

## ENGINE AIR INTAKE GRILLE WITH WATER/EMBER SEPARATOR

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The air intake shall be concealed behind the cab grille. The water and ember separator shall set behind the cab grille on the officer's side. This may be cleaned or replaced by tilting the cab.

Y\_\_N\_\_

## FLAT ROOF

A flat roof shall be provided with an interior floor to ceiling height of 57".

Y\_\_N\_\_

## PAINTED CAB ROOF WITH ATP STRIPS

The exterior surface of the cab roof shall be painted in compliance with the cab paint specifications detailed elsewhere in this specification document. A strip of embossed, skid resistant aluminum treadplate shall be provided on the cab roof, parallel to and along each side of the aerial device.

Y\_\_N\_\_

## AUXILIARY ENTRANCE STEPS

Auxiliary cab entrance steps shall be provided at each cab door opening, below the cab, to reduce the cab entrance step height to approximately 12 inches.

Y\_\_N\_\_

## INTERMEDIATE CAB STEPS

Four (4) stationary steps shall be provided, one at each cab door. The steps shall be approximately 12.0" long, have a 9.0" radius, and be located to the front of each cab step well. The steps shall be constructed of aluminum grating.

Y\_\_N\_\_

## CAB SIDE ACCESS DOOR

Two (2) stainless steel cab side access doors shall be provided on the cab, one each side between the front doors and front crew cab windows. Door openings shall be approximately 13.00" wide x 25.00" high. "D" handle type latches shall be provided on the lower rearward part of the door. The doors shall be vertically hinged with a chain type stop.

Doors shall be hinged at the front.

Y\_\_N\_\_

## CAB SIDE ACCESS DOOR SILL PROTECTORS

Brushed stainless steel sill protectors, approximately .50" wide, shall be provided on the cab side access door sills to protect the painted finish.

Y\_\_N\_\_

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## CAB SIDE ACCESS DOOR FRAME SCUFFPLATES

A brushed stainless steel scuffplate shall be installed on the striker side of each cab side access door frame and shall run the full height of the door opening. The scuffplate shall be a single bend configuration that guards the outer door frame post from damage and chips to the paint.

Y\_\_N\_\_

## SIDE ACCESS DOOR SCUFFPLATES

Aluminum treadplate scuffplates shall be provided on the inside of two (2) cab side access door(s) to protect the painted finish.

Y\_\_N\_\_

## FRONT STAINLESS STEEL INNERLINERS

Semi-circular innerliners shall be provided in each front wheel housing. They shall be constructed of 304 stainless steel and shall be bolted in place so they may be removed if damaged. Self-tapping sheet metal screws are not acceptable. The outside edge of the innerliner shall be bolted along its entire length. The bottom edge of liner shall not have a formed reinforcement flange to avoid trapping dirt and debris.

Y\_\_N\_\_

## FRONT FENDERETTE

Polished stainless steel fenderettes shall be installed in the front wheel openings. They shall be sufficiently wide to completely cover the outside rear tire and reduce wheel splash along the sides of the cab. They shall be installed with 1/4" hex head bolts (self-tapping sheet metal screws are not acceptable) and have a full width rubber welt placed between the fenderette and body wheel well opening flange. Outside edge of welting shall form a "V" bead between fender and cab side face to prevent moisture from entering. Inside edge shall also have a small raised bead. Outside edge of fenderette, at the wheel opening shall be rolled inward to eliminate a sharp edge and avoid injury when cleaning apparatus.

Y\_\_N\_\_

## FRONT AND REAR MUD FLAPS

Heavy duty mud flaps with manufacturer's "script and flame logo" shall be provided at the rear of each front wheel and at the rear of the rear dual wheels. Front flaps shall be 15" wide and rear flaps shall be 24" wide. Mud flaps shall be made of 0.38" heavy duty rubber material to prevent "sailing".

Y\_\_N\_\_

## CONVEX CROSSOVER MIRRORS

An 8" diameter convex mirror with polished stainless steel housing shall be provided on the right front of the cab above the windshield.

Y\_\_N\_\_

## MIRRORS

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Two (2) Rosco Accustyle heated mirrors with remote or equivalent shall be installed on the cab doors, one on each side of the cab. The flat upper mirror shall measure 7" x 14" and the lower convex section shall measure 6.5" x 6". The mirrors shall have a chrome finish.

Y\_\_N\_\_

## WINDSHIELD

The windshield shall be of tinted automotive laminated safety plate glass with a curved two-piece design. The windshield shall have approximately 2900 square inches of visual area. Right and left hand windshield glass shall be symmetrical and interchangeable from side to side to minimize spare parts stock and expense. Windshield shall be installed and held in place by an extruded rubber molding with a bright finish, decorative, locking bead. Cab shall be finish painted prior to windshield glass being installed.

Y\_\_N\_\_

## WINDSHIELD WIPERS AND WASHERS

One (1) wet arm operated windshield wiper shall be provided for each plate of windshield glass for accessibility and optimum windshield wiping surface areas. Wipers shall be two speed type with intermittent wiping feature. One (1) control switch shall be provided and located on the self-canceling directional switch for both wiper arms. The switch shall combine the on/off (automatic park position), two speed, intermittent and washer functions in one control. The turning switch shall activate the wipers and control speed, and pushing it shall operate the washers.

Y\_\_N\_\_

## WINDSHIELD WASHER RESERVOIR

A four (4) quart windshield washer fluid reservoir shall be provided. It shall be accessed in the driver's step well with a remote fill. A visual inspection shall be possible without tilting the cab (NO EXCEPTIONS).

Y\_\_N\_\_

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## DOOR WINDOWS

A retractable window with automotive type tempered safety glass shall be provided in all four (4) cab doors. All glass shall be tinted. Glass shall slide in stainless steel side channels with cloth/fiber liners. Rubberized fiber seals shall be located at the bottom of the window opening to prevent water and debris from entering the interior of the door when the glass is up (or down). A seal shall be placed on both sides (interior and exterior) of the glass. The front door glass shall be 23.75" high x 25.75" wide upper and 27.50" wide lower. The rear door glass shall be 23.75" high x 30" wide. The door window openings shall be trimmed on the exterior side with a smooth, black, poly vinyl chloride (PVC) molding

Window regulator shall be manufactured by the Muncy Corporation and shall be the enclosed, sliding flexible shaft, gear type for ease of operation and reliability. The shaft shall enter a vinyl plastic protective sheath whenever it is exposed. Window crank effort shall be the same over the entire raising or lowering process. Crank arm shall be installed on a 3/8" square shaft (splined shaft will not be acceptable). Regulator shall not require any periodic maintenance over its lifetime. Sector gear/lever action or sprocket/moving arm type regulator mechanisms will not be acceptable.

Y\_\_N\_\_

## CREW CAB SIDE GLASS

There shall be a side window on each side of the cab between the doors. They shall be tinted and be manufactured of automotive tempered safety glass. Each window shall be 23" high x 17" wide to provide maximum vision. They shall be installed and held in place by an extruded rubber molding with a chrome plated, decorative, locking bead. Cab shall be finish painted prior to window glass being installed.

Y\_\_N\_\_

## CAB TRIM

Decorative molding is to be provided across the front and along both sides of the cab just below the windshield level. The molding shall be the automotive adhesive type made of poly vinyl chloride (PVC). It shall be 5/8" wide with chrome plated outer edges and a 5/16" textured black center strip.

Y\_\_N\_\_

## CAB DOOR HINGES

The following exterior cab door hinges shall be polished: passenger front left side, passenger rear left side, passenger front right side, passenger rear right side and any cab side access doors present.

Y\_\_N\_\_

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## CAB HANDRAILS AND GRAB HANDLES

Handrails shall be 1-1/4" diameter extruded aluminum, knurled, with a bright anodized finish.

All handrail stanchions shall be chrome plated. They shall be bolted to the body with 1/4" stainless steel hex head bolts. Stanchions shall have a rubberized gasket placed between them and the body surface they are mounted on. A drain hole shall be provided in each bottom stanchion.

Handrails and handles shall be installed as follows:

Four (4) 24" handrails shall be installed on the side of the cab, one just to the rear of each cab door.

Four (4) 6" chrome grab handles shall be provided, one on the inside of each cab door:

Two (2) 12" rubber covered grab handles shall be provided, one on the driver's side and officer's side front A-pillar, above the door hinge, to assist in entry to the cab.

Two (2) 12" rubber covered grab handles shall be provided, one on each rear crew door hinged-pillar, on the hinged side of the door, to assist in entry to the cab.

Y\_\_N\_\_

## REAR CAB HANDRAIL

One (1) 18" handrail shall be installed on the rear of the cab on the driver's side at a 30 degree angle to provide a 3-point stance for accessing the turntable. The handrail shall be 1-1/4" diameter extruded aluminum, knurled, with a bright anodized finish.

All handrail stanchions shall be chrome plated. They shall be bolted to the body with 1/4" stainless steel hex head bolts. Stanchions shall have a rubberized gasket placed between them and the body surface they are mounted on. A drain hole shall be provided in each bottom stanchion

Y\_\_N\_\_

## REAR CAB FOLDING STEP

One large chrome plated folding step with a minimum of 42 square inches of serrated non-skid surface per step shall be installed on the rear of the cab on the driver's side to assist in accessing the turntable. Each step shall be tested to withstand a minimum of 2000 pounds static load. Heavy duty stainless steel springs shall be incorporated in the hinge to hold the step in either the open or closed positions.

Y\_\_N\_\_

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## CRASH TEST

The cab shall be certified for the following tests:

SAE J2420: Cab Over Engine (COE) Front Strength Evaluation - Dynamic Loading - Heavy Trucks

SAE J2422: Cab Roof Strength Evaluation - Quasi Static Loading - Heavy Trucks

ECE Regulation 29: Protection of Occupants of Cab in Commercial Vehicle

Performance Measure:

1. After undergoing each test, the cab of the vehicle shall exhibit a survival space accommodating a 50th percentile male ATD in the median position without contact between the manikin and non-resilient parts for all seating positions.
2. None of the doors shall open during the tests.
3. The cab attachments may be distorted or fractured, however, the cab shall remain attached to the vehicle frame in at least one attachment location.

Y\_\_N\_\_

## SEAT ALARM SYSTEM

A seat alarm system provided by LifeGuard Technologies or equivalent shall be installed in the cab, as mandated by NFPA 1901 14.1.3.10. The alarm system shall be activated anytime the parking brake is released or the automatic transmission is not in park. The system shall consist of an audible alarm that can be heard at all positions designated to be occupied while the vehicle is in motion and a visual display to the driver or officer showing the condition at each seating position.

The visual display shall give the following indications:

- |                         |   |
|-------------------------|---|
| Affirmative Indication: | Senses occupant and belt is buckled.      |
| Negative Indication:    | Senses occupant and belt is unbuckled.    |
| Negative Indication:    | Senses no occupant and belt is buckled.   |
| Dark:                   | Senses no occupant and belt is unbuckled. |

Y\_\_N\_\_

## HELMET HOLDER - BODY

The helmets shall be stored in the body in accordance with NFPA 1901 current regulations:

NFPA 14.1.8.4.1 A location for helmet storage shall be provided.

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

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Y\_\_N\_\_

## CAUTION LABELS

Caution labels shall be posted in the cab so that they shall be visible from each seat position. The labels shall read: "Do Not Wear Helmets While Seated".

Y\_\_N\_\_

## HEADLINER

The cab shall be provided with a removable headliner for ease of servicing the electrical wiring placed in the cab roof. The headliner shall consist of 3 layers of material. Next to the roof shall be a layer of acoustical insulation made of polyester and polypropylene fibers. The next layer is 1/4" thick Luann. Finally, there is a 1/4" thick layer of foam/perforated acoustical vinyl.

The headliner shall be the multi-piece type (minimum of three (3) sections) so that the entire liner does not have to be removed for localized maintenance.

Y\_\_N\_\_

## BACK LINER

The cab shall be provided with an aluminum treadplate removable back liner. The back liner shall be the multi-piece type (minimum of three (3) sections) so that the entire liner does not have to be removed for localized maintenance.

Y\_\_N\_\_

## ENGINE ENCLOSURE

The engine enclosure structure shall have a 1-1/4" thick inner lining, on the engine side, comprised of aluminized foil and foam/barrier composite for heat insulation. The tunnel cover shall have 1/2" decoupled foam lower and 1" decoupled foam upper covering, on the cab interior side, for noise insulation. The top forward portion of the hood shall have a full-width riser with a sloped face for the installation of the switch panel. The sloped panels shall be used for vehicle accessory controls. A minimum of 1" shall be provided between the right edge of the accelerator pedal and the side of the engine hood. A removable cover over the engine enclosure and insulation shall be coated with Line-X to act as an insulator for sound and engine temperature, as well as to provide an easy-to-clean work surface.

In order to optimize in-cab vision and seating space for the driver, officer and crew members while properly seated and belted in turn-out gear, the maximum overall dimensions of the engine enclosure shall not exceed:

- 26.25" from floor to top of engine tunnel between driver and officer
- 26.25" from floor to top of engine tunnel at front center dash panel
- 31.25" from floor to top of driver and officer dash panels

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## ACCESSORY MOUNTING STRUCTURE

The top portion of the engine enclosure shall have an 1/8" thick aluminum channel frame located between the engine tunnel structure and the cover to support the cover and facilitate mounting of accessories and equipment.

Y\_\_N\_\_

## ENGINE COMPARTMENT ACCESS DOOR

An access door shall be provided at the rear of the engine enclosure for routine engine fluid checks. The access door shall be insulated from engine heat with aluminized foil/foam/barrier composite and sealed to prevent exhaust fumes from entering the crew cab.

Y\_\_N\_\_

## 18" STEERING WHEEL WITH TILT/TELESCOPE

A padded 18" steering wheel with center horn ring shall be provided. The upper steering column shall be of the tilt and telescopic type. A self-canceling directional switch with wiper control and headlight dimmer control shall be mounted on the steering column with an ICC four way flash switch. The self-canceling directional switch shall be easily removable and replaceable without removing the steering wheel or column assembly. The junction of the shaft and the cab floor shall be sealed to prevent air exchange between the cab interior and exterior.

Y\_\_N\_\_

## LINE-X FOR CAB DASH

The cab dash shall be sprayed with Line-X or equivalent having a high resistance to abrasion and tearing. A vinyl cloth glued or laminated in some manner to a metal backing surface shall not be acceptable.

The Line-X shall absorb impact without surface damage. The Line-X shall be resistant to gasoline, diesel fuel, paints, bleaches, organic solvents and other cleaning agents and chemicals. It shall include sound dampening and vibration elimination properties.

The Line-X shall be solvent free and be environmentally safe to apply with no VOC or CFC hazards. Its surface shall have a non-glare, granular texture and be easily cleaned with common cleansing compounds.

Y\_\_N\_\_

## OFFICER'S DASH

The top of the officer's dash shall include a pocket for a laptop computer. The pocket shall measure 15.25" wide x 8.75" deep x 4.00" high at the rear.

Y\_\_N\_\_

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## SUN VISORS

Two (2) 6.625" x 29.50" padded sun visors shall be provided, one on the driver's side and one on the officer's side. Visor shall be supported at both ends to prevent drooping.

Y\_\_N\_\_

## VEHICLE DIMENSION SIGN

A sign shall be provided in the front cab area indicating the height of the completed apparatus in feet and inches, length of the completed apparatus in feet and inches, and the gross vehicle weight rating (GVWR) in tons.

Y\_\_N\_\_

## CABLE RACEWAY

A cable raceway, 1.75" x 5.75", shall be installed underneath the officer's floor. It shall run between the officer's kick plate and the seat riser.

Y\_\_N\_\_

## DRIVER'S SEAT

The driver's seat shall be an H.O. Bostrom Sierra Air-100 reclining high back seat with air suspension or equivalent. A DOT approved 3-pt. shoulder harness shall be furnished that is red in color. The seatbelts shall meet NFPA 1901 length requirements.

The driver's seat shall be held at NFPA regulated height by a C Channel Bracket.

Y\_\_N\_\_

## OFFICER'S SEAT

An H.O. Bostrom Tanker 450 SCBA seat shall be provided for the officer or equivalent. This seat shall have 5" horizontal adjustment. A DOT approved 3-pt. shoulder harness shall be furnished that is red in color. The seatbelts shall meet NFPA 1901 length requirements.

The officer's seat shall be held at NFPA regulated height by a 3CR12 stainless steel frame that measures 15.50" wide x 10.60" high x 17.30" deep, front to back.

One (1) NFPA compliant IMMI SmartDock Gen 2 SCBA bracket shall be installed in the seat(s). The bracket shall utilize a locking mechanism that engages during deceleration. The bracket shall hold the cylinder in place while in transit and release using no straps, levers, buttons or switches.

Y\_\_N\_\_

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## REAR SEATING

The rear crew cab section shall contain two (2) outboard rear facing H. O. Bostrom Tanker 450 SCBA passenger seats or equivalent. The seats shall be installed one (1) each side at the rear of the engine enclosure. The seating area shall allow maximum room for fire fighters in full turn out gear. DOT approved 3-pt. shoulder harnesses shall be furnished that are red in color. The seatbelts shall meet NFPA 1901 length requirements.

Two (2) NFPA compliant IMMI SmartDock Gen 2 SCBA bracket shall be installed in the seat(s). The bracket shall utilize a locking mechanism that engages during deceleration. The bracket shall hold the cylinder in place while in transit and release using no straps, levers, buttons or switches.

Y\_\_N\_\_

## SEAT BELTS

The seats shall have a standard seat belt attached that meets FMVSS and NFPA 1901 current edition requirements.

Inboard rear facing seats shall have a 2 point lap belt style seat belt. All other seats shall receive a 3 point fixed D Loop style seat belt.

Y\_\_N\_\_

## SEAT UPHOLSTERY

Four (4) cab seats shall be upholstered in black H.O. Bostrom "Durawear" waterproof cloth fabric or equivalent.

Y\_\_N\_\_

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## INTERIOR DÉCOR

The following components shall be black in color:

Headliner

Head bumper over crew doors

Backliner, if using padded acoustical material

Vinyl visors, if selecting vinyl

The following components shall always be black in color:

Floor matting and floor mat edging

Headliner trim

Backliner trim

Crew heater, complete assembly

Electrical panels

Officer's dash access panel

Plastic snap plugs for wire access holes

Door seals

Seat risers

Underseat compartments

Seat belt retractor cover.

Rubber covered grab handles

Map Desk, if present

Y\_\_N\_\_

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## INTERIOR LINE-X DECOR

The following items, with Line-X finish or equivalent, shall be dark gray in color:

Engine cover and center dash, including engine access door and electrical access door

Driver and officer dashes

Overhead dash

Upper interior door panels (Void if selecting brushed S/S)

Lower door panels (Void if selecting brushed S/S or ATP)

All interior compartment exteriors, if selecting (large storage compartment and side access compartments)

A map box shall always have a black Line-X finish.

Y\_\_N\_\_

## CAPACITY SIGN

A sign visible to the driver, that states the number of personnel the vehicle is designed to carry, shall be provided.

Y\_\_N\_\_

## STORAGE COMPARTMENT

A storage compartment shall be provided on the rear wall of the cab. The compartment shall have a "sweep out" design. It shall have a removable, false, back wall for electrical routings. There shall be a ROM roll up door with tall bottom rail centered on the front of the compartment. The compartment shall be constructed of 1/8" smooth aluminum. The exterior shall have a Line-X finish. The overall outside dimensions of the compartment shall be 40" wide x 14" deep x 40" high. It is understood that the usable interior height of the compartment shall be diminished by the height of the roll of the door. Due to the space taken up by the false wall and the inside face of the door, the usable interior depth of the compartment shall be 11.125".

Y\_\_N\_\_

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## ADJUSTABLE SHELF OR SHELVES

Two (2) adjustable shelf or shelves shall be provided in the cab compartment. Each shelf shall be made from 1/8" aluminum sheet metal and have welded corners and a DA'd finish on the outside edge of the shelf. It shall be supported by four (4) stainless steel angles bolted to "alumastrut" tracks.

Y\_\_N\_\_

## 12 VOLT RECEPTACLE(S) IN CAB COMPARTMENT

One (1) 12 volt 15 amp power receptacle(s) shall be provided in the upper right corner of the rear wall of the cab interior storage compartment. The receptacle shall be wired battery direct..

Y\_\_N\_\_

## COMPARTMENT LIGHTS - LED

The cab interior storage compartment shall have two (2) ROM V4 LED lighting strips installed at each door. The full height lighting strips shall be mounted vertically on both sides of the cab compartment door. The V4 lights shall be designed and manufactured to be water resistant meeting the IPX7 industry standard. Lights shall have a streamline optic lens and a fixed lumen output across 9-16vcc. LED lights shall draw no more than 0.33 amps at 12.8vdc per 12 inch section of light strip. The LED lights shall be mounted in an anodized aluminum track. A switch, installed in the door jam, shall be used to activate the lights.

Y\_\_N\_\_

## 120 VOLT SHORELINE POWERED RECEPTACLE(S) IN CAB COMPARTMENT

One (1) 120-volt, 20 amp, 3-wire receptacle(s) shall be provided and located in the upper right corner of the backplate of the cab interior storage compartment. A brushed stainless steel coverplate shall be provided to protect the receptacle. The receptacle shall be powered by the shorepower inlet and labeled accordingly.

Y\_\_N\_\_

## FINISH – CAB COMPARTMENT INTERIOR(S)

One (1) cab compartment interior(s) shall have no finish applied.

Y\_\_N\_\_

## TOOL MOUNTS

Two (2) PAC Tools #K5003 IronsLoks shall be provided and mounted on the outside of the cab compartment, one (1) each side. Exact location shall be determined at the PreConstruction meeting.

Y\_\_N\_\_

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## HEATER/DEFROSTER-FORWARD CAB

A front cab heater/defroster unit shall be provided. The unit shall have a heating capacity of 30,000 BTU and combined 520 CFM variable speed blower assembly. The unit shall be located on top of the engine tunnel and shall be centered on the windshield. Defroster outlets shall be located at the bottom of the windshield and shall direct air flow from the unit up on to the windshields. Vents shall be located in the drivers and officers dashes and kick plates.

Y\_\_N\_\_

## MANUAL COOLANT SHUTOFF VALVE - INLET

The forward cab heater inlet flow shall be interrupted by one (1) manual engine coolant shutoff valve mounted behind the engine for auxiliary engine coolant flow control. The valve shall be 1/4 turn style with label for ease of identification.

Y\_\_N\_\_

## REAR CREW CAB HEATERS

Two (2) rear crew cab heaters with a combined rating of 64,000 BTU output and 850 CFM air flow shall be provided. The rear cab heaters shall be mounted under the rear facing outboard seats each side. The units shall have a variable speed blower, and a removable, replaceable filter.

Y\_\_N\_\_

## MANUAL SHUTOFF VALVE FOR CREW CAB HVAC COOLANT INLET

The crew cab heater inlet flow shall be interrupted by one (1) manual engine coolant shutoff valve mounted behind the engine for auxiliary engine coolant flow control. The valve shall be 1/4 turn style with label for ease of identification.

Y\_\_N\_\_

## MANUAL SHUTOFF VALVE FOR CREW CAB HVAC COOLANT - RETURN

The crew cab heater return flow shall be interrupted by one (1) manual engine coolant shutoff valve, mounted on the lower radiator tube, for auxiliary engine coolant flow control. The valve shall be 1/4 turn style with label for ease of identification.

Y\_\_N\_\_

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## AIR CONDITIONER

The cab shall be equipped with an air conditioning system that shall include two (2) ceiling mounted evaporators. The air conditioning system shall have a combined cooling capacity of 79,000 BTU and variable speed blower assemblies for a combined 1100 CFM. The main controls for the unit shall be located in the dash. The evaporators shall have air diffusers to allow for multi-directional airflow. Each diffuser shall be adjustable up and down and side-to-side for individual preference. Each evaporator shall have it's own sump style drain system for removal of condensation. The sump shall be integrated into the ABS evaporator cover.

The evaporators shall be compliant with all EPA regulations and use R-134A Refrigerant. All hoses used in the air conditioning system shall be "barrier" type construction for containment of the refrigerant. The condenser shall be a stacked type, low profile, dual fan compact design with dryer and pressure switch included. The condenser shall be located on the cab roof. It shall be protected from damage with a cover, except for the fan opening at the top and openings for the hoses.

The air conditioning system shall exceed the industry norm by cooling the cab from the ambient temperature of 100 degrees Fahrenheit at 50% relative humidity to an average cab temperature of 75 degrees Fahrenheit in 30 minutes.

Y\_\_N\_\_

## AUXILIARY FAN(S)

Two (2) adjustable 6" auxiliary fan(s) shall be provided near the center portion of windshield with a two (2) speed control switch on the mounting pedestal.

Two (2) located one (1) on each side of the center windshield post on the dash

Y\_\_N\_\_

## HVAC CONTROLS - FORWARD CAB

HVAC controls shall feature rotary switches, function labeling, backlighting, and have colored indicators and shall be located in the center dash area between the driver and officer.

Y\_\_N\_\_

## MAP BOX

A 7" high map box shall be provided between the driver and officer. It shall be installed on the top of the engine hood. The box shall have four (4) slots. Two (2) slots on one side shall support 8-1/2" x 11" documents, while the two (2) slots on the other side shall support 11" x 17" documents. The slots shall all slant at a 13 degree angle downward.

The map box shall be constructed of .125 inch thick smooth 5052 aluminum sheet metal with welded assembly. It shall be covered with black Line-X.

Y\_\_N\_\_

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## TWO-WAY RADIO ANTENNA MOUNT(S)

Two (2) universal antenna mount(s), model MATM, with 17 feet of coax cable and weatherproof cap shall be provided for the two-way radio equipment. The mount(s) shall be installed in the cab roof. The cable shall be routed to the lower dash, or as requested by the customer, with any excess cable secured in an accessible location. All installation locations and cable routing shall be confirmed with the customer during the pre-construction process.

Y\_\_N\_\_

## POWER STUDS (OVERHEAD SWITCH PANEL)

Four (4) studs shall be provided in the overhead switch panel to provide a 12 volt feed. The studs shall consist of a 12 volt direct stud, switched battery stud, switched ignition stud and grounding stud.

Y\_\_N\_\_

## POWER STUDS (CAB DASH)

Four (4) studs shall be provided in the cab dash area to provide a 12 volt feed. The studs shall consist of a 12 volt direct stud, switched battery stud, switched ignition stud and grounding stud.

Y\_\_N\_\_

## BUSS BAR (UNDER OFFICER'S SEAT)

A four (4) stud buss bar shall be provided under the officer's seat to provide a 12 volt feed. The studs shall consist of a 12 volt direct stud, switched battery stud, switched ignition stud and grounding stud.

Y\_\_N\_\_

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## STOKES BASKET STORAGE ON CAB ROOF

A stainless steel storage tray for a Junkin #JSA-200 Plastic Stretcher shall be provided on the aft portion of the cab roof. Tray shall be mounted on stainless steel unistrut. Retaining straps shall be provided.



Y\_\_N\_\_

## GENERAL 12-VOLT ELECTRICAL WIRING REQUIREMENTS

### 12-VOLT ELECTRICAL SYSTEM

The apparatus shall be equipped with a heavy-duty 12-volt electrical system. All 12-volt electrical equipment installed by the apparatus manufacturer shall conform to modern automotive practices. All electrical wiring and components installed in the apparatus shall be suitable for use in severe duty emergency vehicle applications.

Y\_\_N\_\_

### GENERAL WIRING AND WIRE HARNESS CONSTRUCTION

Unless otherwise specified by the component supplier, all insulated wire and cable shall conform to SAE J1127 *Low Voltage Battery Cable* type SGX or STX, or SAE J1128 *Low Voltage Primary Cable* type SXL, GXL, or TXL.

Circuit feeder wires shall be stranded copper or copper alloy conductors of a gauge rated to carry 125 percent of the maximum current for which the circuit is protected.

Conductor materials and stranding, other than copper, shall be permitted if all applicable requirements for physical, electrical, and environmental conditions are met as dictated by the end application.

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The overall covering of conductors shall be moisture-resistant loom or braid that has a minimum continuous rating of 194°F (90°C) except where good engineering practice dictates special consideration for loom installations exposed to higher temperatures.

The overall covering of jacketed cables shall be moisture resistant and have a minimum continuous temperature rating of 194°F (90°C) except where good engineering practice dictates special consideration for cable installations exposed to higher temperatures.

Y\_\_N\_\_

## CIRCUIT IDENTIFICATION

All wiring shall be uniquely identified by a circuit number and color coding. The identification shall be referenced on a wiring diagram. Wires less than 8 AWG shall be permanently identified at least every 2.0 inches (50.8 mm) by a circuit and function code. Cables equal to or larger than 8 AWG and wires included in jacketed cables shall be permanently identified by circuit number at all terminations.

Y\_\_N\_\_

## WIRING CONNECTIONS

All wiring connections and terminations shall use a method that provides a positive mechanical and electrical connection. The wiring connections and terminations shall be installed in accordance with the device manufacturers instructions. Secondary locks shall be utilized on all connectors that are secondary lock capable.

Exterior exposed wire connectors shall be environmentally sealed to withstand elements such as temperature extremes, moisture and automotive fluids. Seal plugs shall be installed in all unused sealed connector cavities.

All ungrounded electrical terminals shall have covers or be in enclosures to protect against corrosion, excessive heat, excessive vibration, physical damage, liquid contaminants, dust, and other environmental factors.

Wiring splices shall be crimp-type, molded, or sonic weld type. Adhesive lined heat shrink tubing shall be used to seal and insulate splice joints.

Y\_\_N\_\_

## WIRE AND CABLE ROUTING

Wiring routed through holes in sheet metal or castings shall have edges protected by an appropriately sized grommet.

Wiring shall be routed to avoid metal edges, screws, trim fasteners and abrasive surfaces. When such routings are not possible, protective devices (shields, caps, etc.) shall be used to protect the wires. When wires must cross a metal edge the edge shall be covered with a protective shield.

Wiring shall be routed to provide at least 3 inches (76.2 mm) clearance to moving parts, unless

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positively fastened or protected by a conduit.

Wire routings should avoid areas where temperatures exceed 180° F (82.2° C) and a minimum clearance of 6 inches (152.4 mm) shall be maintained from exhaust system components. Where compliance with this requirement is not possible, high temperature insulation and heat shields shall be utilized.

When wiring is routed between two members where relative motion can occur the wiring shall be secured to each member, with enough wire slack to allow flexing without damage to the wires.

Wiring to all circuit components (switches, relays, etc.) in exposed locations shall provide a drip loop to prevent moisture from being conducted into the device via the wire connection.

Routing wires into areas exposed to wheel wash shall be avoided if possible. When such routings cannot be avoided, adequate clipping or protective shields shall protect the wires from stone and ice damage.

Wiring shall be secured in its intended location with appropriately sized bolt-on clips and nylon wire ties.

Electrical components designed to be removed for maintenance shall include a sufficient length of wire to allow the component to be pulled away from the mounting area for inspection and service work.

Bulkhead type connectors or sealed fittings shall be used to prevent the entry of liquid contaminants into weather tight enclosures.

Y\_\_N\_\_

## SPARE WIRES

Wiring harnesses from/to major power and signal distribution areas of the apparatus shall include spare wires for future expansion of the system.

Y\_\_N\_\_

## ELECTRICAL SYSTEM COMPONENTS

Serviceable components shall be readily accessible. Switches, relays, terminals and connectors shall have a dc rating of 125% of the maximum current for which the circuit is protected.

A distributed power and signal system shall be utilized on the apparatus to minimize power supply voltage drops. Power and signal distribution areas in the cab shall be concentrated in five (5) areas.

A lower cab power and signal distribution center shall be located in the center forward portion of the cab "dash". It shall be hinged and opened by unlocking two (2) top mounted, double hinged, lift and pull latches. This area shall contain relays and circuit breakers installed in a logical and serviceable fashion.

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An additional lower cab power and signal distribution center shall be located below the officer's dash behind the kickplate.

An upper power and signal distribution area shall be located in the forward portion of the cab ceiling, above the engine tunnel. Components in this area shall be permanently labeled and easily accessible by opening a hinged cover.

A power and signal distribution area shall be located in the pump module, if applicable. Components in this area shall be permanently labeled and easily accessible.

A power and signal distribution area shall be located on the front of the forward body compartments. Components in these areas shall be permanently labeled and easily accessible.

All electrical components or devices installed in an exposed area on the outside of the cab or body shall be mounted in such a manner, or protected by a gasket, caulking or other means, so that moisture shall not accumulate in it.

Y\_\_N\_\_

## CORROSION PROTECTION

Externally exposed, non-plug type, electrical connections shall be given a hand applied or sprayed application of an industrial standard insulation coating with a minimum rating of 2100 volts per mil thickness. Insulation shall protect the connection from water induced electrical corrosion and accidental short circuiting. Should the connection be loosened or removed during the manufacturing process another coating shall be applied after it has been refastened or replaced.

Y\_\_N\_\_

## MAIN BATTERY AND STARTER CIRCUITS

### BATTERY POWER BUSS

All positive cables from the batteries shall be connected directly to a battery positive buss bar located as close to the batteries as practical. The alternator shall be wired directly to the battery positive buss bar through the ammeter shunt, if one is provided.

Y\_\_N\_\_

### ENGINE STARTER AND INTERLOCK CIRCUITS

The starter solenoid(s) shall be connected directly to the battery positive buss bar. An interlock shall be provided to prevent the operator from engaging the starter when the engine is running.

Y\_\_N\_\_

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## BATTERY GROUND BUSS AND SINGLE POINT GROUND SYSTEM

All negative (ground) cables from the batteries shall be connected directly to a battery negative buss bar located as close to the batteries as practical. A 2/0 AWG cable shall connect the battery negative buss bar to the chassis frame. Appropriately sized ground feeder cables shall be utilized to provide a low impedance ground path to the negative buss bar for all electrical devices on the apparatus.

Y\_\_N\_\_

## APPARATUS GROUND BONDING

A 2/0 AWG cable shall connect the battery negative buss bar to the chassis frame. The cab, pump enclosure (if furnished), and body structure shall be electrically bonded to the vehicle frame by with two (2) 2 AWG braided copper ground strap.

Y\_\_N\_\_

## EMI/RFI PROTECTION

The apparatus electrical system and related devices shall have the ability to function in the severe electromagnetic environment typical of fire ground operations.

Y\_\_N\_\_

## EMI/RFI EMISSIONS

State-of-the-art electrical system design and components shall be utilized to ensure the suppression of radiated and conducted EMI (electromagnetic interference) and RFI (radio frequency interference) emissions that may cause communication and navigation radio-reception interference. The electrical system and related components shall comply with the applicable sections of J551/1 *Performance Levels and Methods of Measurement of Electromagnetic Compatibility of Vehicles, Boats (up to 15 m), and Machines (16.6 Hz to 18 GHz)*

Y\_\_N\_\_

## EMI/RFI SUSCEPTIBILITY

The apparatus electrical system shall incorporate immune circuit designs, filtering, shielding and twisted-pair wiring to control EMI/RFI susceptibility. Particular attention shall be given to harness and cable routing to minimize the potential for conducted and radiated signal susceptibility.

Electrical / electronic equipment on the apparatus shall not be susceptible to radiated and conducted EMI/RFI emissions from on-board radio transmitter(s) and shall comply with the requirements of SAE J551-12 *Vehicle Electromagnetic Immunity--On-Board Transmitter Simulation*.

Y\_\_N\_\_

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## ELECTRICAL SYSTEM PERFORMANCE TESTING

An operational test shall be conducted to ensure that all installed electrical equipment is properly connected and is in working order. The apparatus alternator shall be tested with the total continuous electrical load applied and engine running up to the engine manufacturer's governed speed for a minimum of 2 hours. Additionally, all warning lights shall be run continuously during the three (3) hour NFPA pump certification test (or at another time for not less than three (3) hours). Activation of the load management system (if furnished) shall be permitted during this test. An alarm sounded by excessive battery discharge, as detected by the low voltage warning system, or a system voltage of less than 11.8 V dc at the battery for more than 120 seconds, shall be considered a test failure.

Y\_\_N\_\_

## CAB DASH AND INSTRUMENTS FOR 2013 EMISSIONS ENGINE

A non-glare instrument panel, custom designed to accommodate the appropriate functions, shall be provided. Illumination shall be provided for controls, switches, instruction plates, gauges, and instruments necessary for the operation of the apparatus. The cab dash shall be forward slanted, and constructed of aluminum.

A system shall be provided that interacts with the engine electronics and eliminates redundant senders and switches. The electronic engine gauges shall receive information on the SAE J1939 data link to improve reliability and gauge accuracy. Connectors shall be utilized for ease of service. The dial face shall be black with white lettering. The primary letters shall be in Imperial with the secondary, smaller letters in metric. The dial shall have international non-language symbols for the gauge function (except speedometer). Gauges shall have illumination with a monochrome LCD display located on the speedometer gauge. They shall also have a 250 degree dial sweep for greater definition of scale. SAE J1939 Faults and Warnings shall be displayed on the LED display.

Y\_\_N\_\_

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## DRIVER'S INSTRUMENTATION

The following gauges shall be provided:

### Main Gauges

- 3" Speedometer: 0-85 mph with built-in LCD display
- Speedometer Mode Switch: Allows operator to select menu items in the display screen
- Speedometer Up Switch: Allows operator to scroll up through display menu items
- Speedometer Down Switch: Allows operator to scroll down through display menu items

3" Tachometer: 0-4000 rpm

### Satellite Gauges

- 2" Fuel Level: Empty – full with low level warning indicator
- 2" Voltmeter: 10-16 VDC
- 2" Coolant Temperature: 100-240 Degrees Fahrenheit
- 2: Engine Oil Pressure: 0-80 psi
- 2" Transmission Oil Temp: 100-320 Degrees Fahrenheit
- 2" Front Air Pressure: 0-150 psi
- 2" Rear Air Pressure: 0-150 psi
- 2" DEF Level: Empty – full with low level warning indicator

Y\_\_N\_\_

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## DRIVER'S INDICATOR LIGHT MODULE

The following indicators shall be mounted in a removable modular panel in front of the steering column. The indicators shall be identified with universal ISO 2575 symbols where applicable and visible to the driver while seated. All applicable indicators in the modular panel shall automatically illuminate for 1 second upon activation of the ignition switch to verify operation:

Battery Switch "On" green indicator light

Ignition Switch "On" indicator

Check Transmission amber indicator light

Check Engine amber indicator light

Stop Engine (Engine Warning) red indicator light

High Exhaust Temperature (HEST) amber indicator light (if applicable)

Diesel Particulate Filter Regeneration (DPF) amber indicator light (if applicable)

Wait to Start amber indicator light (if applicable)

Malfunction Indicator Light (MIL) amber indicator light (if applicable)

ABS warning amber indicator light

ATC/ESC activated amber indicator light

Spring (Parking) Brake "On" red indicator light

High Beam "On" blue indicator light

Low air pressure red indicator light

Left Turn signal green indicator light

Right Turn signal green indicator light

General Warning red indicator light (if applicable)

DEF Level Indicator Light

Y\_\_N\_\_

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## AUDIBLE CAB ALARMS

Audible alarms shall be provided in the cab to alert the operator of conditions that require attention. The alarm device(s) shall be audible in the driving compartment and feature an adjustable volume control.

An intermittent audible tone shall sound when the following conditions are present and the parking brake is disengaged:

Active Hazard Warning –

(Do Not Move Apparatus; Door Open, Tower Raised, etc.)

Seat Belt Warning

A steady audible tone shall sound when the following conditions are present:

Check Engine

Check Transmission

Stop Engine (includes High Engine Temperature and Low Engine Oil Pressure)

Low Voltage

Engine Air Filter Restriction

Y\_\_N\_\_

## DRIVER'S AND OFFICER'S CONTROLS

The following rocker style control switches shall be identified and accessible to the driver while seated. Switches shall include integral indicator lights (where applicable) to advise that the switch has been energized and identification labels shall be illuminated for night driving.

Ignition switch with green indicator light

Engine Start switch

Headlight / Tail-Marker-ID light switch

Instrument Panel Dimmer control rheostat

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The following controls shall be stalk mounted on the steering column and identified and visible to the driver while seated:

Turn Signal Control and 4-Way Hazard Warning switch

High-beam headlight switch

Windshield wiper control switch

Windshield washer control switch

The following controls shall be identified and accessible to the driver while seated:

Parking (Spring) Brake Control

Other controls (as defined elsewhere in this specification)

The following controls shall be identified and accessible to both the driver and officer while seated. Controls shall be identified and illuminated for night driving.

HVAC control panel

High Idle control switch

Other controls (as defined elsewhere in this specification)

Y\_\_N\_\_

## EMERGENCY & WORK LIGHT SWITCH PANEL - DRIVER'S SIDE

All emergency light and work area lighting control switches shall be mounted in a removable panel located in the overhead position on the driver's side of the cab. The light switches shall be "rocker" type with an internal indicator light (where applicable) to show when the switch is energized. All switches shall be properly identified by an illuminated label for night driving.

A master warning light switch and individual switches shall be provided to allow pre-selection of emergency lighting.

Y\_\_N\_\_

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## DOOR AJAR/HAZARD INDICATOR LIGHT (DO NOT MOVE APPARATUS)

A Whelen "T0" series 2" round red flashing LED light with chrome flange shall illuminate automatically whenever the apparatus parking brake is not fully engaged and any of the following conditions exist:

Any passenger or equipment compartment door is open.

Any ladder or equipment rack is not in the stowed position.

Stabilizer system is not in its stowed position.

Any other device permanently attached to the apparatus is open, extended, or deployed in a manner that is likely to cause damage to the apparatus if the apparatus is moved.

The hazard warning light shall be identified with a label that reads: "Do Not Move Apparatus When Light Is On." The light shall be located on the ceiling between the driver and the officer.

Y\_\_N\_\_

## DIGITAL CLOCK

A 12/24 hour real-time digital clock shall be identified and visible to both the driver and officer while seated.

Y\_\_N\_\_

## ELECTRICAL WIRING REQUIREMENTS - INTELEX™ PLUS

The apparatus shall be equipped with an INTELEX™ PLUS management system or equivalent for control of the electrical system devices, where applicable.

Y\_\_N\_\_

## CIRCUIT PROTECTION

Circuit protection devices shall be utilized to protect each electrical circuit. All circuit protection devices shall be sized according to 125% of the anticipated load to prevent wire and component damage when subjected to extreme current overload.

Y\_\_N\_\_

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## SOLID STATE CIRCUIT PROTECTION

Intalex power distribution modules shall utilize solid state output channels and feature fully protected high-side drivers (+12V) to protect wiring. High-side drivers shall provide overload protection, current limitation, transient protection, and replicate the function of an automatic reset circuit breaker. If output current exceeds the rated amperage, the output shall automatically turn off. After 30 seconds, the module shall attempt to re-energize the load. If the output is still overloaded, it shall remain off until the power is cycled or the output is manually reset through the Information Center. In the event of a communications loss with the vehicle's control module, all outputs not controlling a moving device, such as a ladder rack, shall remain in their previous state until communication is restored or the power is cycled.

Y\_\_N\_\_

## NON-SOLID STATE CIRCUIT PROTECTION

Circuit breakers shall be Type-I automatic reset (continuously resetting) and conform to SAE J553 or J258 unless operational requirements and/or safety concerns dictate Type-III manual reset type conforming to SAE J1625. Automotive-type fuses conforming to SAE J554, J1284, J1888 or J2077 shall be utilized when required to protect electronic equipment.

Y\_\_N\_\_

## POWER CONTROL RELAYS AND SOLENOIDS

Power control relays and solenoids shall have a direct current (dc) rating of 125 percent of the anticipated current load.

Y\_\_N\_\_

## INFORMATION CENTER

An IQAN-MDL2 unit with 6.5" transfective high resolution TFT color display or equivalent capable of displaying graphical images as well as text messages shall be located on the cab dash. The main display page shall include the date and time and shall indicate what soft buttons will display additional pages. Additional information pages shall be provided for the seat belt status, warning indications, not stowed indications, and open doors. Information pages shall be selected for viewing by the operator by selecting a corresponding button on the display module.

Y\_\_N\_\_

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## APPARATUS STATUS INDICATORS AND AUDIBLE ALARMS

If a monitored "Not Stowed" or "Warning" condition is active, a corresponding status indicator shall flash accordingly. The alarm system status indicator shall flash yellow when a "Not Stowed" condition is active. The alarm system status indicator shall flash red when a "Warning" condition is active. The alarm system status indicator shall remain steady red if no "Not Stowed" or "Warning" conditions are active. In addition to visual indicators, audible alarms shall sound when designated conditions activate the "Not Stowed" and "Warning" status indicators.

Y\_\_N\_\_

### WARNING INDICATOR

A flashing red triangle symbol shall alert the vehicle occupants of an active "WARNING" condition. This is defined as a situation or status on the vehicle that is of high priority or "mission critical" nature. The flashing red triangle shall be displayed on the Information Center and dash gauge panel in front of the driver. The following are typical "Warning" (high priority) conditions:

HYDRAULIC FILTER	TRANSMISSION TEMP	LOW MANAGE
CAB NOT LOCKED	LOW VOLTAGE	
AIR RESTRICTION	ABS FAULT	

Y\_\_N\_\_

### NOT STOWED INDICATOR

A flashing Not Stowed indicator shall alert the vehicle occupants of an active "Not Stowed" condition. This is defined as a situation or status on the vehicle that is not of high priority or "mission critical" nature, but requires attention before the vehicle is put in motion. The following are typical "Not Stowed" (not high priority) conditions:

AERIAL RAISED	FRONT BRAKE LOCK
DECK GUN RAISED	JACKS EXTENDED

The following items are considered Not Stowed only when the parking brake is released.

LADDER UP	JACKS EXTENDED	Q2B TILTED
LIGHT TOWER UP	DECK GUN RAISED	DS TELE LIGHT UP
OUTRIGGERS	STEP DOWN	PS TELE LIGHT UP
DS HATCH OPEN	PS HATCH OPEN	

Y\_\_N\_\_

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## AUDIBLE ALARMS

The following conditions shall cause the audible alarm to sound “steady” (not an intermittent beep); signifying a “mission critical” condition exists that requires immediate attention.

STOP ENGINE	CAB NOT LATCHED	LOW VOLT
LOW AIR	ABS FAULT	CHECK ENGINE
LOW COOLANT	CHECK TRANSMISSION	LOW OIL PRESSURE

Corresponding “Low Air”, “Stop Engine”, “Check Engine”, and “Check Transmission” visual indicators shall be located in the dash gauge panel in front of the driver.

The following conditions shall cause a chime alarm to sound “intermittently” (i.e., beep), once the parking brake is released, signifying a condition exists that may become “mission critical” if not quickly addressed.

ANY LIGHT NOT STOWED  
ANY BODY DOOR OPEN  
ANY CAB OR CREW CAB DOOR OPEN

Y\_\_N\_\_

## OPEN DOORS / DEPLOYED EQUIPMENT RACKS / EXTENDED STEPS

When a cab or compartment door is open, a step is extended, or equipment (i.e., ladder) rack is deployed, the “DOORS” indicator shall flash. Pressing the corresponding button shall display an overhead graphical representation of the apparatus. This image depicts the open cab door(s), open compartment door(s), deployed equipment rack(s), and/or extended step(s). The chime alarm shall also sound when the parking brake is released.

Y\_\_N\_\_

# Town of Westbrook 0300 Bid Specifications: Aerial Ladder Truck

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## AUTOMATED ELECTRICAL LOAD MANAGEMENT SYSTEM

The apparatus shall be equipped with an automated load management system. The load management system shall monitor battery voltage and activate the engine high idle system (provided NFPA interlocks have been established) before disabling any electrical loads. If engine high idle is not available or activation does not result in sufficient battery system voltage, individual electrical loads shall be automatically and sequentially deactivated until voltage returns to an acceptable level. Loads shall be sequentially reactivated to avoid a sudden large voltage demand on the system. Electrical loads defined in NFPA 1901 as “minimum continuous” shall not be subject to automatic load management. Load prioritization shall be independently field programmable by authorized users.

If the load management system becomes active, the “LOAD MANAGEMENT” indicator shall flash on the "Warnings" page.

Y\_\_N\_\_

## LOAD SEQUENCER

A sequential switching device shall automatically energize the specified optical warning devices to minimize potentially damaging voltage fluctuations due to the sudden addition or removal of large current demands on the electrical system. Upon activation of the “EMERGENCY MASTER” warning switch and provided the individual optical warning device switches are also activated, the following loads shall be activated (or deactivated) in 0.5 second intervals:

Front Light Bar

Side Light Bar (if applicable)

Front and Rear Flashing Lights

Side Warning

Rear Beacons

High Beam Headlight Flash

Y\_\_N\_\_

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## DATA RECORDER

A LifeGuard Technologies on-board electronic recording device or equivalent shall record select apparatus status and usage information. The data logging unit shall communicate with all major vehicle component electronic control units, including engine, transmission, anti-lock brakes and the body electrical system controller. It shall record seat belt status of ten seat positions. The data logger shall also communicate with the RollTek System or equivalent if present. All recorded events shall include date and time stamped information.

The recorder shall be capable of recording 100 engine hours' worth of minute-by-minute data. When memory capacity has been reached, the system shall erase the oldest data first. All data stored shall be uploadable by the user to a computer and importable into a data management software package. The software shall be capable of running on both Windows and Apple operating systems and shall be capable of producing reports over a specified time range.

Reports shall include: Raw second-by-second data, daily logs for the time the engine is running for a given data, weekly summaries showing maximum values each hour for each day, monthly summaries showing maximum values each day for every day of the month.

Y\_\_N\_\_

## ELECTRICAL SYSTEM DIAGNOSTICS

The apparatus shall feature on-board electrical system diagnostics and provision for off-board diagnostic service equipment.

Y\_\_N\_\_

## ON-BOARD DIAGNOSTICS

On-board diagnostic indicators shall be provided to support rapid troubleshooting of the INTELEX™ PLUS based electrical power and signal system or equivalent. The input and output status of each INTELEX™ PLUS system module shall be easily determined through easy to use display pages.

Switches shall be provided in the cab to allow the operator or service personnel to obtain On-Board diagnostic information from the ABS system and Engine Controller.

A troubleshooting guide shall be provided with the vehicle to assist with interpretation of the diagnostic signals.

Y\_\_N\_\_

## OFF-BOARD DIAGNOSTIC PROVISION

A USB interface port shall be provided for service access to the INTELEX™ PLUS data bus or equivalent. The diagnostic port shall be mounted inside the cab on the driver side in a location that is accessible from the ground.

Y\_\_N\_\_

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## DASH LAYOUT

The Manufacturer shall furnish a dash layout drawing to the Fire Department for their review and approval. The drawing shall detail the locations for installation of radios, sirens, light switches, gauges, etc. Due to the cab dash configuration and electrical wiring design, the components shall have designated locations that each will fit. The Fire Department shall review and approve the layout during the Engineering Conference. Drawing shall be provided upon notice of award.

Y\_\_N\_\_

## REAR VIEW CAMERA SYSTEM

A Safety Vision rear view color camera system, model SV-CLCD70BA Kit shall be provided and installed. The system shall consist of the following components:

- One (1) Safety Vision model #SV-LCD70BA 7" video observation monitor 7.9" wide x 4.5" high x 1.1" deep with speakers, and 2 port in-line control box with 2 triggers.
- One (1) model #SV-625B-KIT non-shuttered rear vision camera with hood and microphone. This camera shall have 18 infrared illuminators and shall be, installed on the rear upper bulkhead, close to center
- One (1) model #SV-523B video cable ( 65 ft.)
- Mounting hardware and brackets.

A heavy duty monitor bracket, model SV-LCD-RM1.0-4 shall also be provided.

The monitor shall be installed hanging from the overhead console.

Y\_\_N\_\_

## WARRANTY

Safety Vision provides a one (1) year manufacturers warranty on this camera system.

Y\_\_N\_\_

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## RIGHT SIDE VIEW CAMERA SYSTEM

A second Safety Vision right side view color camera system, shall be provided and installed. The system shall consist of the following components:

Part #	Description	Qty
1	SV-LCD50-65-620 5" Color LCD, 2 port in-line control box w/2 triggers, Day/Night Color Camera, 29' cable, all mounting hardware.	1
2	SV-SBRKT BMMB38 SIDE MOUNT CAMERA BRACK	1
3	SVS-20MMF 20 Meter M/F Cable (Rear camera cable to splitter)	1
4	SV-Y2VIDEO Camera splitter	2
5	SV-513B 29' CABLE (cable from splitter to both monitors)	4
6	SVS-10MMF 10 Meter M/F Cable (side camera cable to splitter)	1

The 5" monitor shall be installed in the Driver's side outrigger control panel on interior face of the door.

The camera and monitor shall activate with the 'Aerial Master' switch.

The camera shall be mounted to the bottom of the officer's side mirror loop

The intent of this installation is so that the Operator can view the right side outrigger while operating the outrigger.

This camera shall also be tied into the monitor in the cab allowing it to be utilized for blind spot viewing (tied to the turn signal trigger) and also to spot for the outrigger placement as the truck pulls up on scene.

Y\_\_N\_\_

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## BATTERIES

Six (6) Champion 12V Group 31 950 CCA batteries or equivalent shall be installed three each side of the cab under the rear entrance way.

Heavy-duty battery cables shall be provided to maximize power available to the electrical system.

Y\_\_N\_\_

## JUMPER CABLE STUDS

A pair of jumper cable studs with color coded covers shall be provided under the driver's side battery box.

Y\_\_N\_\_

## BATTERY BOXES

Battery compartments shall be constructed of stainless steel with structural steel tubes at the corner mounting points and shall be located one (1) each side mounted on the vehicle frame. They shall be well ventilated and enclosed to protect against road splash and debris. Suitable provisions shall be provided for drainage.

The batteries shall be held firmly in place by providing a full frame type top clamp which encloses the battery set on all four (4) upper corner sides. The one piece clamp shall be fabricated of 3/4" angles and be held in place by two (2) "J" shaped clamping bolts. Battery inspection shall be available by tilting the full tilt cab.

Y\_\_N\_\_

## BATTERY MATS

The batteries shall be installed on a non-corrosive Turtle Tile mat.

Y\_\_N\_\_

## SELECTOR SWITCH - BLUE SEA 9003

A master load disconnect switch shall be provided between the battery positive buss bar and the remainder of the switched battery electrical loads on the apparatus. A green "battery on" pilot light that is visible from the driver's position shall be provided.

One (1) single battery system switch mounted near the driver's side front entrance in a location so it may be turned off by a person standing on the ground outside the vehicle. It shall have the capacity to handle 350 amps of continuous power.

Y\_\_N\_\_

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## BATTERY CHARGER

There shall be one (1) Kussmaul model #091-35/10 "Auto Charge 35/10" single battery charger or equivalent system installed in the vehicle's electrical system. The 35 amp battery charger circuit shall be fully automatic and shall maintain the truck batteries at a full charge level when connected to a 120 VAC source. A remote mounted indicator shall be provided which will contain one bar graph to display the condition of the batteries. The remote indicator shall be mounted in the cab overhead console. A 10 amp "Battery Saver" circuit shall be provided for the charging of rechargeable hand lights, portable radios and other loads while the unit is connected to the 120 VAC source.

It shall be located on the floor behind the driver's seat.

Y\_\_N\_\_

## AUTO EJECT PLUG

A Kussmaul model #091-55-20-120, 120 VAC, 20 amp "Super Auto Eject" shoreline power connector or equivalent shall be provided for the battery charger. The shoreline power connector shall be provided with a spring loaded cover to prevent water from entering when the shoreline is not connected. A label shall be permanently affixed at the power inlet that indicates the line voltage in volts and the current rating in amps.

Shoreline connection location shall be behind the driver's door on cab side.

Y\_\_N\_\_

## HEADLIGHTS

On the front face of the cab, on either side of the front grille, shall be a removable panel. The removable panel shall provide service access to the cab dash electrical components and wiring harness and be housed in a custom raised and chrome bezel.

Two (2) Sylvania Silverstar high/low beam bulbs and two (2) Sylvania Silverstar low beam only bulbs shall be mounted in the lower portion of the removable panels. The headlights shall be quad type, rectangular halogen with bright finished trim rings and bezels. The low beam headlights shall be located at the outer position.

Y\_\_N\_\_

## FRONT DIRECTIONAL LIGHTS

There shall be one (1) Whelen 600 Series LED amber arrow directional signal light installed on the upper portion of the removable panel, within the bright trim molding located on each side of the cab front face. Light lens shall have an amber arrow shape with black background and shall be provided with a "flash" pattern; a "sweep" pattern shall not be allowed. . They shall be mounted in a chrome plated dual light bezel that matches the headlight housing.

Y\_\_N\_\_

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## HEADLIGHT BEZELS

An additional pair of bright finished bezels shall be provided for the optional warning lights.

Y\_\_N\_\_

## LIGHTS

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

Y\_\_N\_\_

## TURN/MARKER LIGHTS

One (1) TruckLite model 60115Y LED amber turn/marker light shall be provided and installed forward of a single rear axle or between tandem rear axles on each side of the vehicle. The lights shall have black flanges.

Y\_\_N\_\_

## REAR MARKER LIGHTS

A Britax long stemmed "LED" dual faced #427 marker light shall be placed at each rear corner of the body. The front lens shall be amber; the rear lens shall be red.

Y\_\_N\_\_

## LICENSE PLATE LED LIGHT & BRACKET

A steel license plate bracket, painted black, shall be installed on the rear of the vehicle. Mounted on the license plate bracket shall be a chrome light bracket containing a 12 volt LED lamp that shall illuminate the license plate.

Y\_\_N\_\_

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## D.O.T. REFLECTORS

Reflectors shall be placed on the cab and body as required by Federal standards. An amber reflector, Signal Stat, model 32ADB, shall be placed on each side of the cab. Four (4) Signal Stat model 32DB red reflectors shall be located on the rear face and sides of the body. The reflectors shall be rectangular in shape.

Y\_\_N\_\_

## SIDE DIRECTIONAL LIGHTS

Britax model #L428, short rubber side LED directional lights shall be provided in addition to the front turn signals. One (1) light shall be mounted just above the front fender on each side of the cab. Lamp shall have an amber plastic lens at front and a red lens facing rear.

Y\_\_N\_\_

## BRAKE/TAIL LIGHTS

Two (2) Whelen series 600 maximum intensity LED red brake/tail lights, model 60R00XRR, shall be vertically mounted, at the rear of the apparatus, one on each side. All brakes lights shall be shall be programmed for "steady burn" operation in compliance with FMVSS No. 108.

Y\_\_N\_\_

## TURN SIGNAL LIGHTS

Two (2) Whelen series 600 LED amber arrow turn lights, model 60A00TAR, shall be vertically mounted, at the rear of the apparatus, one on each side. They shall be provided with a "flash" pattern; a "sweep" pattern shall not be allowed.

Y\_\_N\_\_

## BACK UP LIGHTS

Two (2) Whelen series 600 maximum intensity clear LED back up lights, model 60C00WCR, shall be vertically mounted, at the rear of the apparatus, one on each side.

Y\_\_N\_\_

## BEZELS

Three (3) pair of Whelen #6EFlange chrome plated bezels shall be provided for the 600 series rear stop, turn, and backup lights.

Y\_\_N\_\_

## REAR SCENELIGHTS

Two (2) Whelen M6ZC Super-LED scene lights with 12 diodes and 8-32 degree optics and a chrome plated flange ring shall be installed on the upper rear of the apparatus, one on each side. These lights shall be switched from the cab dash.

Y\_\_N\_\_

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## OUTRIGGER SPOT LIGHTS

Two (2) Whelen PAR36 chrome plated floodlights, with 12 diodes, shall be installed, one on each side of the apparatus above the outriggers, to illuminate the area for spotting the outriggers in the down position. The lights shall be wired to a switch on the cab dash and shall also automatically activate when the PTO is engaged. Each light is equipped with a switch on the lighthead. This switch shall be dependent on the switch on the lighthead.

Y\_\_N\_\_

## LIGHT ACTIVATION

The cab ground and step lights shall be activated with the cab door open switch.

The step and ground lights on the body shall be activated with the parking brake in conjunction with the marker lights.

Y\_\_N\_\_

## CAB STEP LIGHTS

Eight (8) TecNiq model EON or equivalent, LED step lights shall be provided, two (2) at each cab entrance door. They shall be mounted one (1) above and one (1) below each intermediate step.

Y\_\_N\_\_

## BODY STEP LIGHTS

There shall be one (1) TecNiq Eon or equivalent LED strip light center mounted under the turntable, and one (1) centered on the back of the cab wall along the roof edge, to illuminate the top area of the forward body section.

There shall be two (2) TecNiq Eon or equivalent LED strip lights on the top of the intake/gauge panels on the forward body, one each side of the body, to illuminate the panels and the step at their bases.

There shall be a LED step light with mounted on the pedestal to illuminate the area around the pedestal. This light shall be activated with the aerial PTO.

There shall be two (2) TecNiq Eon or equivalent LED lights mounted, one on each side of the body, in the rear face of the wall aft of the rear jacks. These lights shall illuminate the top step of each access ladder.

There shall be two (2) TecNiq Eon or equivalent LED strip lights, one on each side of the body, mounted to the underside of the top step of each access ladder to illuminate the lower steps.

There shall be two (2) TecNiq Eon or equivalent LED strip lights on the boom support to illuminate the decking. The lights shall be installed near the top of the support, one facing forward, one facing rearward.

There shall be two (2) TecNiq Eon or equivalent LED strip lights installed to illuminate the

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interior work area of the platform.

There shall be four (4) TecNiq Eon or equivalent LED lights with chrome bezels installed on the outside of the platform, facing downward to illuminate the step surface. There shall be two (2) lights on each side of the platform.

Y\_\_N\_\_

## GROUND LIGHTS

Four (4) weatherproof TecNiq #T410 or equivalent LED ground lights shall be provided underneath the cab, per NFPA requirements.

Y\_\_N\_\_

## GROUND LIGHTS

Four (4) weatherproof TecNiq #T410 or equivalent LED ground lights shall be provided underneath the body, per NFPA requirements. Two (2) shall be located under the rear body access ladders, one on each side and two (2) shall be under the rear of the body.

Y\_\_N\_\_

## GROUND LIGHTS

Two (2) weatherproof TecNiq #T410 or equivalent LED ground lights shall be provided underneath the body, per NFPA requirements. Two (2) shall be located under the forward body, one on each side.

Y\_\_N\_\_

## ENGINE COMPARTMENT WORK LIGHT

One (1) Truck-Lite 4094SW engine compartment work light with integral switch shall be provided and wired to illuminate automatically when the cab is tilted. The light shall also be wired through the engine compartment access door switch, providing illumination of fluid dip sticks and coolant overflow reservoir.

Y\_\_N\_\_

## PARKING LIGHTS

Two (2) TecNiq #E960 or equivalent LED, side mounted, surface mounted, parking lights shall be provided. The lights shall have a stainless steel housing. They shall be installed one each side of body in the rear wheel well area. Light mounting fixture shall be designed so that light is angled to shine out to the rear and down towards the ground. They shall be switched on from the driver's position in the cab.

Y\_\_N\_\_

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## INTERIOR CAB DOME LIGHTS

Four (4) Weldon 8080-7000-13 red/clear LED lights with push button or equivalent shall be mounted in the cab ceiling. Two (2) in front (driver & officer) and two (2) in the crew cab. All lights shall be controlled by a switch by the lens and shall have a black bezel.

Y\_\_N\_\_

## AUTOMATIC DOOR SWITCHES

Automatic door switches shall be provided for the cab dome lights.

Clear lights shall be activated by opening of cab door.

The white dome light activates with the automatic door switch.

Y\_\_N\_\_

## MAP LIGHT

A Sunnex model HS671-00 pivot and swivel map light with on/off switch or equivalent, shall be located on the instrument panel within reach of the officer.

Y\_\_N\_\_

## HANDLIGHT(S)

Four (4) Streamlight "Survivor" #90503 LED handlight(s) with charger/holders and both 120 volt AC and 12 volt DC cords shall be provided and mounted in the cab. The color shall be orange.

Y\_\_N\_\_

## EXTERIOR COMPARTMENT LIGHT - LED STRIP(S)

Four (4) exterior compartment(s) shall have a ROM V4 LED lighting strip or equivalent installed. The lighting strip shall be mounted horizontally on the ceiling next to the door framing in all specified body compartments. The V4 lights shall be designed and manufactured to be water resistant meeting the IPX7 industry standard. Lights shall have a streamline optic lens and a fixed lumen output across 9-16vcc. LED lights shall draw no more than 0.33 amps at 12.8vdc per 12 inch section of light strip. The LED lights shall be mounted in an anodized aluminum track. A switch, installed in the door frame, shall be used to activate light.

Specify which compartment(s) shall receive lighting: Compartments above the rear wheels, two (2) each side.

Y\_\_N\_\_

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## EXTERIOR COMPARTMENT LIGHTS - (2) LED STRIP(S)

Six (6) exterior compartment(s) shall have a ROM V4 LED lighting strip or equivalent installed on both sides of the door. The lighting strips shall be mounted vertically along both sides of the door framing in all specified body compartments. The V4 lights shall be designed and manufactured to be water resistant meeting the IPX7 industry standard. Lights shall have a streamline optic lens and a fixed lumen output across 9-16vcc. LED lights shall draw no more than 0.33 amps at 12.8vdc per 12 inch section of light strip. The LED lights shall be mounted in an anodized aluminum track. A switch, installed in the door frame, shall be used to activate the lights.

Specify which compartment(s) shall receive lighting:

Compartments just aft of the outriggers, one (1) each side

Compartment aft of the rear jack on the Officer's side

Rearmost compartments, one (1) each side

Ground ladder compartment

Y\_\_N\_\_

## LIGHTBAR WITH EMITTER

A Whelen 72" Freedom FL2 series LED lightbar shall be provided on the cab roof. The inboard, forward facing section of the lightbar shall consist of six (6) 4" x 3" red linear LED lighthoods and two (2) 4" x 3" clear linear LED lighthoods. A red linear LED corner lighthood shall be located in each of the four corners. A red linear LED lighthood shall be located on each end of the lightbar facing the sides of the cab.

A GTT LED emitter assembly shall be installed in the center section on the front of the lightbar. The emitter shall provide intersection control for quick response and reduced risk of accidents. The emitter shall be programmed with high priority flash rate.

The lens color shall be the same as the LED color.

Y\_\_N\_\_

## WARNING LIGHTS

Two (2) Whelen Micro Edge MCFLED2R red Super-LED warning lights shall be provided and installed on the upper rear of the apparatus. Each light shall consist of two (2) Linear-LED Super LEDs with a built-in flasher.

Y\_\_N\_\_

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## WARNING LIGHTS

Ten (10) Whelen model 60R02F\*R red linear Super-LED warning light(s) with chrome plated flange(s) shall be installed on the apparatus. The flash pattern of the light(s) shall be Triple Flash, also known as Comet Flash.

The lens color shall be the same as the LED color.

Y\_\_N\_\_

## WARNING LIGHTS

Four (4) Whelen model 50R02Z\*R red linear Super-LED light(s) with chrome plated flange(s) shall be provided and mounted vertically on the front cab radius, two (2) each side. The flash pattern of the light(s) shall be Triple Flash, also known as Comet Flash.

The lens color shall be the same as the LED color.

Location of each perimeter warning light shall be:

- 1 on each side of the cab front, inboard of the turn signal
- 1 on each side of the cab in a forward position near the bumpers
- 1 on each side of the cab, near the front wheelwell
- 1 on each side of the body, at the top of the wheelwell, aft of the rear axle
- 1 on each side of the rear of the body, below the back-up lights

Y\_\_N\_\_

## MARS 888 FRONT WARNING LIGHT

One (1) Mars Model 888 Oscillating Figure "8" warning light with a polished stainless steel "cone" style housing shall be provided. The bulb shall be the sealed beam halogen type with a 60,000 candlepower rating. It shall be mounted on a pedestal at the center front of the vehicle. Bracket shall be constructed of formed 12 gauge stainless steel. It shall be securely mounted to the tubular framing of the cab between the windshields and just above the cab grille.

The lens color shall be clear.

Y\_\_N\_\_

## AUDIBLE WARNING DEVICES

One (1) automotive electric horn controlled by the steering wheel horn button shall be provided.

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Y\_\_N\_\_

## BACKUP ALARM

One (1) Preco Model LDA-50 backup alarm shall be provided and activated when the vehicle transmission is placed in reverse. Alarm output shall be a minimum of 97 DBA.

Y\_\_N\_\_

## AIR HORN WITH LANYARD CONTROL

Two (2) Grover 1510 chrome air horns shall be provided, one on each side, in the bumper. A pressure protection valve shall be installed in-line to prevent loss of all air from the vehicle air brake system. The horns shall be activated by two lanyard pull cords, one for the officer and one for the driver, terminating into one control valve, located between the driver and officer.

Y\_\_N\_\_

## WHELEN SIREN

A Whelen model 295SLSA1 electronic siren shall be provided in the front bumper. The siren has a selectable output of 100 or 200 watts.

Y\_\_N\_\_

## SIREN SPEAKER

One (1) Federal Model ES100 compact 100 watt speaker(s) shall be provided and recess mounted in the front bumper. One (1) speaker shall be located in the center of the bumper.

Y\_\_N\_\_

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## SIREN/HORN SELECTOR SWITCH

There shall be a three (3) position selector switch that shall allow the driver to switch activation of the automotive horn (air or electric) to the vehicle electric mechanical siren or electronic siren. The switch shall allow the standard steering wheel button to sound either the horn or the sirens.

The selector switch used for electric horn, air horns, electronic siren

Y\_\_N\_\_

## MECHANICAL SIREN WITH SWING-AWAY BRACKET

A Federal Model Q2B siren with chrome plated housing and swing-away bracket shall be mounted in the in the center of the front bumper extension as directed. Two foot switches shall be provided, installed one each side of the cab, on the toe board. There shall be an electric brake control installed in the cab, at the driver's switch panel, properly labeled.

Y\_\_N\_\_

## STAINLESS STEEL BODY CONSTRUCTION

The body and compartments shall be constructed of heavy duty 3CR12 stainless steel. The compartments shall be a "sweep out" design with the floor higher than the door sill. The compartment floors shall be a minimum of 3.5 mm 3CR12 stainless steel. All compartment seams shall be caulked with gray adhesive/sealant. Each compartment shall be rated for 500 lbs. of storage. False bulkhead panels shall be provided on the inside of the rearward wall of the compartment aft the rear wheels and rear stabilizers, and also the compartment aft of the access ladder, to cover and protect all electrical wiring and components. This also provides a clean interior for equipment mounting. These panels shall be removable. Door frames on compartments with hinged doors shall be fabricated by flanging the door opening edges inward 1.88" and bending out again .75" to form an angle.

Y\_\_N\_\_

## ALUMINUM TREADPLATE

A bright aluminum treadplate cover shall be installed over the side compartments. The cover shall not form the compartment top but shall be an overlay. The side edge of the cover shall have a 45 degree outward bend. The forward face of the side compartments shall be covered with bright aluminum treadplate overlays. All body components covered with aluminum treadplate overlays shall be coated with an anti-corrosion compound prior to installation. All treadplate shall be secured with threaded fasteners.

Y\_\_N\_\_

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## BODY MOUNTING SUBSTRUCTURE

The body compartments shall be bolted directly to spacer brackets welded to the aerial torque box. They shall be bolted through the back wall of the compartments in 11 places (5 on Driver's side and 6 on Officer's side) along the length of the body. In addition, the compartments in front of the rear wheels and behind the rear access ladder shall be supported by heavy 3" x 3" x 0.38" gusseted angle L-brackets (1 under front and 2 under rear compartment- each side). The brackets shall be bolted directly to the chassis frame. The body shall also be bolted to the chassis frame at the front and rear of the fender area through gusseted 0.38" formed steel plates (2 each side). The area inside the fender area shall be heavily reinforced to support the weight of the body and additional equipment. The rear access steps also be bolted to the body and gusseted back to the chassis frame with a formed 0.38" steel plate (each side) to help stabilize the steps and the body.

Y\_\_N\_\_

## LEFT SIDE COMPARTMENTS

The left hand side compartments of the main body shall be made of stainless steel. The compartmentation shall consist of one (1) compartment ahead of the rear wheels, one (1) low height upper compartment above the forward rear wheels, one (1) low height upper compartment above the aft rear wheels, and one (1) compartment aft of the access ladder. All compartments shall have roll up style doors except the two (2) low height upper compartments, which shall have horizontally hinged lift-up doors.

The compartment ahead of the rear wheels and aft of the superstructure, shall have a doorframe to doorframe dimension of 35.25" wide x 38.75" high. The clear door opening shall be 32.75" wide x 33.00" high. The usable compartment space for the area under the roll shall be 39.00" wide x 33.00" high x 17.25" deep and the area behind the roll shall be 39.00" wide x 8.25" high x 4.50" deep. This compartment shall have an aluminum shutter type roll up door.

The low height upper compartment above the forward rear wheels shall have a doorframe to doorframe dimension of 53.38" wide x 13.75" high. The clear door opening shall be 49.88" wide x 10.25" high. The usable compartment space shall be 55.25" wide x 15.00" high x 23.50" deep. This compartment shall have a horizontally hinged lift up door.

The low height upper compartment above the aft rear wheels shall have a doorframe to doorframe dimension of 53.38" wide x 13.75" high. The clear door opening shall be 49.88" wide x 10.25" high. The usable compartment space shall be 55.25" wide x 15.00" high x 23.50" deep. This compartment shall have a horizontally hinged lift up door.

The compartment behind the access ladders shall have a doorframe to doorframe dimension of 59.50" wide x 35.75" high. The clear door opening shall be 55.00" wide x 30.00" high. The usable compartment space for the area under the roll shall be 60.50" wide x 30.00" high x 24.25" deep and the area behind the roll shall be 60.50" wide x 8.25" high x 11.50" deep. This compartment shall have an aluminum shutter type roll up door.

The low height upper compartment doors above the rear wheels only shall be of lap type, double panel construction with a minimum of one (1) "Z" shaped 14 gauge support rails placed between the panels to stiffen and reinforce the doors. The doors shall be weather stripped with an

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automotive bulb type extruded rubber inner seal. A second outer seal of closed cell rubber shall be placed on the lap edge of the doors to prevent damage to the paint finish. The doors shall be mounted on stainless steel piano hinges. Isolation tape shall be furnished between the door hinge and door jam. Eberhard 206 latches with stainless steel "D" ring handles shall be provided with a rubber gasket between the "D" ring handle and the door. The lift-up doors shall be held in the opened position with gas cylinder type stays.

Y\_\_N\_\_

## RIGHT SIDE COMPARTMENTS

The right hand side compartment of the main body shall be made of stainless steel. The compartmentation shall consist of one (1) compartment ahead of the rear wheels, one (1) low height upper compartment above the forward rear wheels, one (1) low height upper compartment above the aft rear wheels, and two (2) compartments aft of the rear jack. All compartments shall have roll up style doors except the two (2) low height upper compartments, which shall have horizontally hinged lift-up doors.

The compartment ahead of the rear wheels and aft of the superstructure, shall have a doorframe to doorframe dimension of 35.25" wide x 38.75" high. The clear door opening shall be 32.75" wide x 33.00" high. The usable compartment space for the area under the roll shall be 39.00" wide x 33.00" high x 24.25" deep and the area behind the roll shall be 39.00 wide x 8.25" high x 11.50" deep. This compartment shall have an aluminum shutter type roll up door.

The low height upper compartment above the forward rear wheels shall have a doorframe to doorframe dimension of 53.38" wide x 13.75" high. The clear door opening shall be 49.88" wide x 10.25" high. The usable compartment space shall be 55.25" wide x 15.00" high x 23.50" deep. This compartment shall have a horizontally hinged lift-up door.

The low height upper compartment above the aft rear wheels shall have a doorframe to doorframe dimension of 53.38" wide x 13.75" high. The clear door opening shall be 49.88" wide x 10.25" high. The usable compartment space shall be 55.25" wide x 15.00" high x 23.50" deep. This compartment shall have a horizontally hinged lift-up door.

The compartment behind the rear jack shall have an approximate usable compartment space of 23.00" wide x 38.25" high x 23.50" deep. This compartment shall have an aluminum shutter type roll up door.

The rearmost compartment shall have a doorframe to doorframe dimension of 59.50" wide x 35.75" high. The clear door opening shall be 55.00" wide x 30.00" high. The usable compartment space for the area under the roll shall be 60.50" wide x 30.00" high x 24.25" deep and the area behind the roll shall be 60.50" wide x 8.25" high x 11.50" deep. This compartment shall have an aluminum shutter type roll up door.

The low height upper compartment doors above the rear wheels only shall be of lap type, double panel construction with a minimum of one (1) "Z" shaped 14 gauge support rails placed between the panels to stiffen and reinforce the doors. The doors shall be weather stripped with an automotive bulb type extruded rubber inner seal. A second outer seal of closed cell rubber shall be placed on the lap edge of the doors to prevent damage to the paint finish. The doors shall be mounted on stainless steel piano hinges. Isolation tape shall be furnished between the door hinge

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and door jam. Eberhard 206 latches with stainless steel "D" ring handles shall be provided with a rubber gasket between the "D" ring handle and the door. The lift-up doors shall be held in the opened position with gas cylinder type stays.

Y\_\_N\_\_

## INNERLINERS

Full semi-circular innerliners shall be provided in each wheel housing. They shall be constructed of 304 stainless steel and shall be bolted in place so they may be removed if damaged. Self-tapping sheet metal screws are not acceptable. The bottom edge of liner shall be reinforced along its full length, however, it shall not have a formed reinforcement flange to avoid trapping dirt and debris.

Y\_\_N\_\_

## REAR FENDERETTE

Polished stainless steel fenderettes shall be installed on the rear wheel openings. The fenders shall be wide enough to completely cover the outside rear tire and reduce wheel splash up the sides of the body. They shall be installed with 1/4" hex head bolts, self-tapping sheet metal screws are not acceptable. A full width rubber welt shall be placed between the fenderette and body wheel well opening flange. The outside edge of the welting shall form a "V" bead between the fender and the body side face to prevent moisture from entering. The inside edge shall also have a small raised bead. The outside edge of fenderette, at the wheel opening, shall be rolled inward to eliminate any sharp edges and avoid injury when cleaning the apparatus.

Y\_\_N\_\_

## REAR FENDER PANELS

Painted, 3CR12, stainless steel, removable fender panels shall be provided on the outer face of each fender area. The panels shall be painted to match the job color.

Y\_\_N\_\_

## ROLL UP COMPARTMENT DOORS

The side compartment doors shall be R.O.M./Robinson aluminum shutter roll-up type doors (made in the U.S.A.) with an anodized finish. A magnetic door ajar and compartment light system designed within the door to conceal moving parts and prevent parts exposure in the compartment shall be provided. Slats shall be double-wall box frame extrusion and must be anodized to eliminate oxidation and rusting. Exterior surface shall be flat and interior surface to be concave to help loose equipment from jamming the door. The latch system shall be a full width, one piece, lift bar, enabling operation with one hand. The manufacturer's standard door frame design may be altered or modified to accommodate the roll-up doors.

Y\_\_N\_\_

## ALUMINUM COMPARTMENT DOOR LINER(S)

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Aluminum treadplate overlay shall be provided on the inside of thirteen (13) compartment door(s) to protect the painted finish and to cover inside door hardware.

Y\_\_N\_\_

## BODY DOOR HINGES

All piano hinges on the main body exterior doors shall be polished.

Y\_\_N\_\_

## FINISH – BODY SIDE COMPARTMENT INTERIOR(S)

Eleven (11) body side compartment interior(s) shall be finished with gray Zolatone or equivalent type paint.

Y\_\_N\_\_

## FINISH – BODY SIDE COMPARTMENT INTERIOR(S)

Eleven (11) body side compartment interior(s) shall be clear coated following the Zolatone Clear Coat or equivalent application process in the same components that received a Zolatone application.

Y\_\_N\_\_

## VENTS

Compartment vents shall be provided to meet the requirements of NFPA 1901, current edition.

Y\_\_N\_\_

## STABILIZER BAYS

The bays for the rear stabilizers shall be lined with aluminum treadplate. No covers shall be provided for the stabilizer areas.

Y\_\_N\_\_

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## ACCESS STEPS

Three (3) stationary steps shall be recessed into the left side of the body to facilitate access to the platform. The steps shall be located aft of the compartment just to the rear of the rear axles. All vertical surfaces shall be covered with aluminum treadplate. The steps shall be of Bustin aluminum grating.

Y\_\_N\_\_

## SWING DOWN STEPS

Under the left side permanent access steps ONLY shall be an additional swing down access step made of Bustin aluminum grating. This step shall be locked in place when swung up in the stored position

Y\_\_N\_\_

## HANDRAILS

A vertically mounted "swimming pool" style handrail shall be installed on the forward side of the left platform access steps ONLY.

One (1) 17" handrail shall be provided on the rearward side of the platform access steps, opposite to the swimming pool style handrail.

The handrails shall be 1-1/4" diameter extruded aluminum, knurled, with a bright anodized finish.

Y\_\_N\_\_

## REAR

All vertical surfaces on the rear of the body shall be smooth painted stainless steel for application of reflective chevron striping.

Y\_\_N\_\_

## COMPARTMENT DOOR SILL PROTECTOR(S)

A brushed stainless steel sill protector, approximately .50" wide, shall be provided on twelve (12) body compartment door sill(s) to protect the painted finish.

The following compartments shall have a brushed sill protector:

Left side rear body compartments (1-4)

Right side rear body compartments (1-5)

Ground ladder compartment

Left side forward body compartments (1-2)

Y\_\_N\_\_

## DRI-DEK

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Twenty Seven (27) black Dri-Dek mat(s) shall be provided and installed on body compartment floors and/or in shelves/trays as specified.

Black Dri-Dek shall be located in/on all compartments and all shelves and trays.

Y\_\_N\_\_

## ADJUSTABLE SHELF OR SHELVES

Twelve (12) adjustable shelf or shelves (with open corners) made from 3/16" smooth aluminum sheet metal shall be provided in the body compartment(s). Each shelf shall be supported by four (4) stainless steel angles bolted to "alumastrut" tracks.

Y\_\_N\_\_

## FINISH - ADJUSTABLE SHELF (OR SHELVES)

Twelve (12) adjustable shelf (or shelves) shall have a DA finish on the outside edge of the shelf.

Y\_\_N\_\_

## ROLLOUT TRAY(S)

Four (4) rollout tray(s) constructed of 0.188" aluminum shall be provided in the body compartment(s). Each tray shall have edges on all four sides for added strength and be mounted on heavy duty rollers able to support a 500 lbs. load. Corners shall be open. Trays shall extend 70% of the slide length and shall be bolted to the compartment floor.

The tray(s) shall be located at:

Compartment forward of the rear wheels, one (1) each side

Rearmost body side compartments, one (1) each side.

Y\_\_N\_\_

## FINISH - ROLLOUT TRAY(S)

Four (4) rollout tray(s) shall have a DA finish applied to the outside edge of the tray.

Y\_\_N\_\_

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## AIR BOTTLE COMPARTMENTS

There shall be two (2) double wheel well enclosures provided to accommodate four (4) air bottles. There shall be a double air bottle compartment located on each side, between the tandem rear axles. The compartments shall be fabricated of the same material as the fender and shall provide a minimum of 23.00" of usable depth and 7.00" of overall height. There shall be a rubber mat provided on the rear wall and on the bottom half of each compartment to prevent damage to the bottles. The double compartments shall have a single wide opening and a raised nylon center divider to prevent the bottles from rolling together.

Y\_\_N\_\_

## AIR BOTTLE COMPARTMENT DOOR(S)

Two (2) compartment door(s) shall be constructed of 14 gauge brushed stainless steel secured by a full length stainless steel hinge and a chrome finish lift and turn lock.

Y\_\_N\_\_

## RUB RAIL - BODY SIDES

Brushed stainless steel rub rails shall be provided along the lower portion of the body, beneath the compartment doors, on each side to prevent damage to the body and finish. The rub rails shall be a minimum of 2-3/8" wide x 1" deep and shall be mounted on rubber supports. Rub rails shall have a 1" x 1" chamfer at the front and rear of the rails. The rails shall protrude 1-11/16" from the face of the body.

Y\_\_N\_\_

## RUB RAIL - BODY REAR

A brushed stainless steel rub rail shall be provided along the lower portion of the rear of the body, to prevent damage to the body and finish. The rub rail shall be a minimum of 2-3/8" wide x 1" deep and shall be mounted on rubber supports. The rub rail shall have a 1" x 1" chamfer on both ends of the rail. The rail shall protrude 1-11/16" from the face of the body.

Y\_\_N\_\_

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## OPEN BIN

An open bin shall be provided atop the body. It shall be located beneath the boom just forward of the platform access ladder. Open bin shall be centered side-to-side. It shall be 120" long x 48" wide x 8" high. Open bin shall be constructed of 3/16" smooth aluminum. The top shall have a double brake for rigidity. The bottom shall have a single brake for rigidity and mounting. The top and outside of the open bin shall have a DA'd finish. The interior shall have a mill finish. Dri Dek shall be placed throughout the open bin. Provisions shall be made for drainage of water.



Y\_\_N\_\_

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## TOWER DESIGN AND PERFORMANCE

A 75 foot, 1000 lb. tip load telescoping tower shall be mounted mid-ship of the apparatus. The boom shall have a totally enclosed box type construction and shall meet or exceed the requirements of all applicable sections of the current edition of NFPA 1901.

The boom shall be designed with a structural safety factor of two to one (2:1) based on the dead and live loads and shall meet ANSI A92.2 Standard for Vehicle Mounted Aerial Devices and NFPA 1901 which requires a static stability safety factor of one and one half to one (1.5:1) based on the rated load. These capabilities shall be established in the unsupported configuration.

The aerial device and all supporting structure shall be third party tested to confirm that the tower meets the original design criteria and the intent of the latest recommended NFPA standard for aerial devices. Such testing shall include the use of brittle lacquer stress coating to identify all stress concentrations, followed by strain gauging to verify that all nominal stresses and stress concentrations have a safety factor that is equal to or greater than 2:1 based on the dead and live load. Proof of conformance with this test requirement shall be provided upon request. NO EXCEPTIONS.

The tower shall be comprised of four (4) sections and extend to a nominal working height of 75 feet above the ground as measured by NFPA 1901 recommendations. The aerial shall have a rated horizontal reach of 65 feet measured in the horizontal plane at zero (0) degrees from the centerline of the turntable rotation, as defined by NFPA 1901. The aerial shall be capable of continuous operation through 360 degrees of rotation and from minus nine (-9) degrees to plus seventy-five (+75) degrees elevation.

Y\_\_N\_\_

## TOWER CERTIFIED RATED CAPACITY

The rated capacity of the platform shall be 1000 pounds while flowing 1000 GPM of water in accordance with NFPA 1901, current edition, with no restrictions regarding boom extension, boom elevation, or rotational orientation.. The platform shall be capable of flowing 2000 GPM of water, provided the monitor stops are set at 45 degrees above the horizontal. There shall be no restrictions regarding the simultaneous use of all three (3) motion functions (elevation, rotation, and extension) with the rated platform capacities either at the main pedestal or in the platform. This unit shall be capable of setting up and operating on street grades of up to 5 degrees. At the maximum grade, the unit shall be capable of operating at the aforementioned manufacturer's rated capacity and platform placement with no operational restrictions.

The tower certifications shall be based on the platform being properly deployed in an unsupported configuration. The capacities shall be based upon 360 degree rotation, up to full extension and from -9 degrees to + 75 degrees. There shall be no restrictions on the tip load while flowing 1000 gpm of water in any direction.

Y\_\_N\_\_

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## INSPECTION CERTIFICATE

An independent third party professional inspection service shall inspect all structural components of the aerial device in accordance with AWS D1.1 Standard For Steel Weldments. Magnetic particle testing shall be conducted to assure the quality of the welds and to detect any flaws or weaknesses so they may be corrected prior to entering the painting process. Nondestructive testing (NDT) shall be performed on all of the components of each unit at a rate of 100% inspection, exceeding the requirements of NFPA 1901 & 1914. Functional tests, load tests, stability tests and visual structural examinations shall be performed on each unit to detect any unusual deflection, noise, vibration or instability characteristics.

The Certificate of Inspection shall certify that all specified standards as set forth in NFPA 1914, current edition, have been satisfied. Proof of third party strain gauge testing shall be provided upon request to support the original design criteria. All NDT procedures shall be fully documented, and meet or exceed the requirements of NFPA 1901 & 1914.

Y\_\_N\_\_

## OPERATION ON GRADES

The aerial is capable of being operated at full rated capacity in every position in which the aerial device can be placed when the apparatus is on a slope of 5 degrees (8.7%) in accordance with NFPA 1901 (19.21.3.1)

Y\_\_N\_\_

## SUPERSTRUCTURE CONSTRUCTION

The superstructure shall be directly mounted to the chassis at a midship point by grade 8 fasteners and not welded directly to the rail. It shall be capable of supporting the positioning of all boom movements and capacities. The superstructure shall be constructed of structural steel solid-welded into such a fashion that the outriggers are directly integrated, providing direct radial support of boom extension off the side extension of the boom.

Y\_\_N\_\_

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## TOWER TORQUE BOX

A torque box shall be provided that transmits boom loads from the superstructure to the rear jacks. The torque box also extends to the rear of the truck to provide enclosed storage for ground ladders. The sub-frame shall be constructed of .25" T-1, 100,000 PSI yield steel plate. The torque tube shall extend from the center of rotation of the turntable to the back of the apparatus. It shall be 25.38 high by 34.00 wide. Chassis mounting plates shall be welded to the sides of the torque box and then it shall be bolted to the frame rails using SAE grade 8 bolts and nuts. The torque box shall also be bolted to the superstructure with grade 8 bolts. The torque box assembly shall be capable of withstanding all torsional and horizontal loading when the unit is supported by the outriggers and the aerial device is fully extended and loaded to capacity.

The torque box shall have structure for mounting the cradle and transferring the boom weight from the cradle through the torque box and into the frame rails.

Y\_\_N\_\_

## STABILIZERS

There shall be six (6) chassis stabilizers to lift the truck off the suspension creating a stable base for tower operations. There shall be two (2) swing-down outriggers mounted directly to the superstructure capable of supporting all of the side operations of the tower, in conjunction with the four (4) vertical corner jacks. A four (4) out and down stabilizer system shall not be acceptable.

Y\_\_N\_\_

## FRONT AND REAR JACKS

The four (4) vertical jacks shall be mounted two (2) in front of the cab and two (2) behind the rear axle. The two in front shall tilt to allow the cab to be tilted for maintenance. The vertical jack housing shall be bolted to a 6" minimum square steel tubing mounted under the chassis frame rails thus providing maximum lifting capacity. The cylinders shall contain integral pilot operated holding valves for maintaining their position during operation of the boom and to secure the cylinder in the event of a hydraulic line failure. Each jack shall also have a U-shaped mechanical safety lock constructed of solid steel. Each safety lock shall have a locking pin on a lanyard with a chrome handle. The ground contact area shall be that which is recommended by NFPA, 1901 with the use of ground plates. An out and down stabilizer system welded to the chassis rail shall not be acceptable.

Y\_\_N\_\_

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## MID BODY OUTRIGGERS (Tormentors)

The two (2) outriggers, one (1) each side of the vehicle, shall be mounted directly to the turntable superstructure at two (2) pivot points. These outriggers shall swing down from their vertical storage position and lock into an A-frame type configuration. The foot pad shall swivel parallel to the longitudinal axis of the truck to match uneven terrain. Span of the outriggers is 235" from the outside edges of the foot pad. The cylinders shall contain integral pilot operated holding valves for maintaining their position during operation of the boom and in the event of failure of a hydraulic line. The outriggers shall be provided with a manually positioned safety pin. The safety pin shall be constructed of high strength steel. Each safety pin shall have a locking pin on a lanyard with a chrome handle.

The ground contact area shall be that which is recommended by NFPA 1901 with the use of ground plates.

Y\_\_N\_\_

## STABILIZER CONTROLS

Six (6) joystick controls for all stabilizers shall be provided on the street side of the apparatus in the forward body compartment just aft of the cab.

The operator shall be able to raise and lower the jacks and outriggers independently while observing them during set up. A single control switch shall also be provided for the operator to raise and lower all jacks and outriggers at once while the interlock is activated. An automatic high idle switch and indicator shall be provided so that automatic engine RPM ramp up from hydraulic requests can be disabled.

Two (2) inclinometers shall be provided to aid in leveling the unit from side to side and front to rear.

The control panel shall be lit by the general compartment light chosen by the fire department.

Y\_\_N\_\_

## OUTRIGGER CONTROL HOUSING

The outrigger/stabilizer controls shall be housed in a dedicated compartment in the left side forward body section. The left side of the forward body section shall have two (2) compartments stacked vertically just aft of the cab. The upper compartment shall be recessed back from the outside edge of the body and shall house the outrigger stabilizer controls..

Y\_\_N\_\_

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## OUTRIGGER ALARM

An automatic electronic warning device (horn) shall be provided to warn personnel when the outriggers leave their nested position. Alarm shall operate only when outriggers are moving.

Y\_\_N\_\_

## CRADLE INTERLOCKS

A cradle interlock system shall be provided which automatically prevents the operator from lifting the aerial device from the cradle unless all outriggers are placed in a load supporting configuration. The system is activated when the foot of the center outriggers contacts the ground and trips a limit switch. An LED indicator light on the jack control panel shall then indicate that the boom can be operated.

An additional interlock shall be provided that prevents outrigger operation when the aerial device is not fully stowed in the cradle.

Y\_\_N\_\_

## SHORT-JACK OPERATIONS

The aerial device shall be capable of operating in a "short-jacked" stance. The aerial device shall require two operators to lift the boom from the cradle. Once the boom is lifted from the cradle, the aerial device shall be fully operational by a single operator to the side of the apparatus with fully deployed outriggers, and shall be denied operation to the short set side. In the event both sides are short set, the operator will automatically be denied operation to both sides. Two methods of overriding the interlock are available: an electric switch, or mechanically moving the solenoid. Both are available to the single operator located at the primary operators station.

Y\_\_N\_\_

## MANUAL OVERRIDES

The manual overrides for the aerial device (clockwise and counterclockwise rotation and boom lowering interlocks) shall be in the turntable control pedestal. Operation of the boom without the outriggers properly set requires the operation of a diverter valve and requires a second operator. The overrides for the outriggers shall be conveniently located behind the jack control panel. The outrigger overrides can be operated by one person, but requires the simultaneous activation of two separate controls to override the safety system.

Y\_\_N\_\_

## OUTRIGGER LIGHTING

Six (6) Whelen TIR3, red LED lights, with cast aluminum bezels, shall be mounted on the outrigger feet, three on each foot. On each foot, one light shall face outward, one shall face forward, and one shall face rearward, to give 180 degrees of illumination. The lights shall be activated by engaging the PTO.

Y\_\_N\_\_

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## REFLECTIVE STRIPING

In compliance with NFPA, there shall be a reflective stripe placed on both of the tension arms for each tormentor outrigger.

Y\_\_N\_\_

## OUTRIGGER PADS AND BRACKETS

A set of six (6) auxiliary outrigger pads shall be installed on the apparatus. The six (6) pads shall each be 24" x 24" and shall be made of 3/8" smooth aluminum with a carrying handle. The pan-style brackets, which hold the pads, shall be installed on the underside of the body, aft of each rear axle on each side of the apparatus. Each bracket shall be capable of holding three (3) of these outrigger pads.

Y\_\_N\_\_

## CRADLE

A heavy-duty rest shall be provided to support the boom in the travel position. Re-enforcement plates shall be attached to the boom base section to protect the aerial when the unit is in the travel position. The cradle shall be located on the top of the torque box. It shall be constructed such that the weight of the boom shall be transferred through the torque box to the chassis frame rails. A limit switch mounted on the cradle shall automatically stop the lowering function of the boom at the proper position in the boom rest.

Y\_\_N\_\_

## HYDRAULIC SYSTEM

All stabilizer, outrigger, and tower movements shall be accomplished by the use of hydraulic power. All functions shall be held in place by holding valves when not in motion. The hydraulic system shall incorporate a pressure relief valve to protect the system from excessive pressure. All hydraulic cylinders shall incorporate pilot operated holding valves to keep them in place or to control their movement when hydraulic pressure is applied. The hydraulic pressure lines shall have a burst pressure of at least four times the operating pressure.

The system shall incorporate two (2) filters and a remote filter condition indicator. One (1) 5 micron high pressure filter shall be placed after the pump and one (1) 10 micron return filter shall be placed in the hydraulic tank. These filters shall be sized for the system required pressure and flow.

Y\_\_N\_\_

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## HYDRAULIC PUMP

The system shall be powered by a pressure compensated load sensing hydraulic pump. The pump shall be sized to operate all boom functions simultaneously without a reduction in speed of any function. The load sense feature operates any function at the optimum pressure to maximize efficiency and minimize heat build-up.

Y\_\_N\_\_

## HYDRAULIC OIL TANK

The hydraulic oil tank shall have a minimum capacity of 70 U.S. gallons and shall be located behind the driver's side compartment forward of the tandem axles. The connection points to the tank shall be on the same side, with internal baffles separating the intake and return. There shall be shut-off valves at these points to isolate the tank, if needed. A filtered breather cap and a basket strainer shall be located in the filler neck. A dip stick shall verify the oil level. There shall be a plaque mounted next to the fill cap labeled "Hydraulic Fluid Only".

Y\_\_N\_\_

## HOOR METER

An aerial hydraulics hour meter shall be provided to accumulate hours when the transmission provides pressure to engage the PTO and the aerial enable switch is engaged.

Y\_\_N\_\_

## EMERGENCY PUMP

The apparatus shall be equipped with an emergency hydraulic pump. The pump shall be driven by a 12 volt electric motor with power from the truck batteries. It shall be capable of providing limited hydraulic power for returning the boom and outriggers to their stowed position in the event of main power failure.. A control switch for the emergency pump shall be located at the outrigger control station and at the aerial control. The control switch shall be a spring loaded momentary type to prevent prolonged operation of the emergency pump.

Y\_\_N\_\_

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## HOT SHIFT POWER TAKE/OFF FOR AERIALS

The apparatus shall be equipped with a power (hot) shift PTO driven by the chassis transmission. An indicator light shall be located in the cab next to the generator switch or the aerial enable switch to indicate when the PTO is engaged.

The following conditions apply for use of the PTO:

If the PTO is used to power the generator only, then the PTO can be engaged by the generator switch when the truck is in motion.

If the PTO is used to power the aerial only, then the PTO can be engaged by the aerial enable switch if the transmission is in neutral and the parking brake is set.

If the PTO is used to power the generator and the aerial, then the generator can be used while the truck is in motion by activating the generator switch. A hydraulic valve, controlled by the aerial enable switch, shall prevent aerial operation until the transmission is in neutral and the parking brake has been set.

There shall be no exceptions to this interlock system since it is designed to protect and safeguard personnel and equipment.

Y\_\_N\_\_

## PTO AERIAL DRIVE SHAFT

The aerial hydraulic pump shall be mounted to the frame with a drive shaft from the PTO to the pump.

Y\_\_N\_\_

## HOIST SYSTEM

The boom shall be elevated or lowered by two (2) hydraulic lift cylinders that shall have a minimum rod size of 4" and a minimum stroke of 72.38" and a minimum bore of 6.0". They shall be mounted one on each side of the boom using spherical bearings. The cap end of the cylinder shall be attached to the turret. The rod end shall be attached to boom ears on the side of the boom at a point located at least 140" from the turret pin to provide better boom stability.

In case of cylinder failure, one cylinder shall be capable of supporting the full load capacities of the platform.

Each lift cylinder shall have two (2) counterbalance valves that lock the cylinders in place when movement is stopped and provide smooth operation during raise and lower functions.

The range of elevation shall be -9 degrees to +75 degrees.

Y\_\_N\_\_

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## EXTENSION-RETRACTION SYSTEM

A full hydraulic powered boom extension and retraction system shall be provided utilizing three hydraulic cylinders synchronized by hydraulic valves. The extension/retraction cylinders shall be equipped with integral (on the cylinder) holding valves to prevent the unit from falling should a pressurized hydraulic line be severed at any point within the system.

Wear pads shall be provided between the telescoping sections for smooth operation. Wear pads shall be composed of high strength polymers with friction reducing additives. No grease- NO EXCEPTIONS.

Y\_\_N\_\_

## ROTATION INTERLOCK SYSTEM

The apparatus shall be supplied with a rotation interlock system. This interlock system shall not allow the aerial to be rotated over the side of the apparatus if the stabilizers on that side are not fully deployed. The interlock system shall include a light and audible alarm that will activate when rotation is no longer allowed. Once rotation is stopped the interlock system shall allow the operator to rotate away from the stopping point without the use of an override. A manual override feature shall be provided that will allow the operator at the turntable the ability to override the interlock system. There shall be NO EXCEPTIONS to this interlock system since it is designed to protect and safeguard personnel and equipment.

The electrical components for the rotation interlock system box/module shall be located in the DC control panel which is positioned in the curbside forward body compartment.

Y\_\_N\_\_

## AERIAL SWIVEL WITH 5" WATERWAY

The aerial device shall be equipped with a swivel installed within the axial centerline of the turntable to allow 360 degree rotation of the aerial device. The swivel shall float on the turntable to prevent side loading. It shall have passages for the hydraulic lines from the hydraulic pump and oil reservoir to the aerial control valve bank, and for a 5" waterway down the center. The swivel shall also maintain electrical continuity of all necessary electrical circuits while ladder is rotating or when it is immobile. A minimum of thirty-six (36) collector rings shall be provided.

Y\_\_N\_\_

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## ROTATION SYSTEM

The turntable bearing shall be of 4-point contact ball construction. The bearing shall have a minimum of 46 mounting holes for attachment to the superstructure and turret. All fasteners shall be grade 8. The outer race of the turntable bearing shall be mounted to the top of the superstructure. The outer race shall have gear teeth to permit interaction with the rotational spur gear.

The turntable shall be bolted to the inner race which will be free to rotate 360 degrees continuously in either direction.

The turntable rotation shall be driven by two (2) rotation assemblies each consisting of a hydraulic motor, a hydraulically activated brake, and a planetary gear reducer. This system shall be capable of 360 degree continuous rotation of the fully extended boom in the direction of the platform water stream while maintaining the manufacturer's rated basket capacity. The angle of elevation shall not affect this performance. The hydraulically activated brake mechanism shall be capable of withstanding all side forces from water flow or sudden stopping of boom rotation. The rotational assembly shall be mounted on the left side of the turntable. (Assuming you are standing on the turntable looking at the boom.)

Y\_\_N\_\_

## TURNTABLE

The turntable shall be constructed of High Strength Low Alloy structural steel and bolted to the inner race of the turntable bearing using grade 8 fasteners. The bearing mounting plate shall be machined to insure a smooth and flat bearing mounting surface. The turntable ears shall support the base section of the boom. There shall be a set of mounting brackets for the lift cylinders.

The standing deck of the turntable shall have aluminum grating in front of the main operator's control pedestal (console) and aluminum treadplate on the remainder.

There shall be a 42" high slip resistant, poly-elastomer material coated stainless steel handrail on the right side of the turntable, next to the control pedestal. (Standing on the turntable, facing the boom.)

The main operator's control pedestal shall be mounted on the street side of the turntable when the boom is in the stored position.

Y\_\_N\_\_

# Town of Westbrook 0300 Bid Specifications: Aerial Ladder Truck

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## MANSAVER BAR

A Fire Research "Mansaver" bar shall be provided at the entrance to the turntable.

Y\_\_N\_\_

## PEDESTAL COVER

A hinged aluminum treadplate cover shall be provided for the control pedestal. Two (2) gas springs shall hold the cover in either an open or closed position.

Y\_\_N\_\_

## PEDESTAL COVER LIGHT

There shall be a TecNiq Eon or equivalent LED lamp installed in the pedestal cover. The light shall be activated when the PTO is engaged.

Y\_\_N\_\_

## PEDESTAL COVER LATCH

There shall be a latch installed on the pedestal cover to assist in holding the cover closed.

Y\_\_N\_\_

## CONTROL PEDESTAL INTERIOR WORKLIGHT

The interior of the turntable control pedestal shall have a Triton model "TLPC" LED worklight or equivalent for control valve service visibility. It shall have a stand alone toggle switch with label.

Y\_\_N\_\_

# Town of Westbrook 0300 Bid Specifications: Aerial Ladder Truck

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## TURNTABLE CONTROL PEDESTAL (CONSOLE )

The aerial control console shall be located on the right side of the turntable facing the tip. The main operator's console contains the controls for boom. The side panel of the pedestal shall be removable. The front and rear panels shall be hinged for access to the hydraulic valves, hoses and electrical wiring.

The control panel on the main pedestal shall consist of the following labeled switches and controls.

- Emergency stop pushbutton with On-light- stops all platform controlability.
- Emergency power toggle switch with protective cover- activates emergency auxiliary electric hydraulic pump.
- Boom rotation override toggle switch with protective cover.
- Spotlight toggle switch – activates boom and stream tracking lights.
- Engine high idle 3-way toggle switch with On-light to control engine idle.
- Turntable aligned green indicator light – illuminates when turntable is aligned.
- Rotation limit exceeded red indicator light.
- Boom overload red indicator light.
- Directional control valves (3) - controls rotation, elevation, and extension of boom.
- Intercom system - allows 2-way communication between main pedestal and platform with controls at both stations.
- The three (3) directional control valves shall control the elevating/ lowering, clockwise/counter clockwise rotation, and extension/ retraction functions for positioning the boom. Each control valve shall be of the electric/ hydraulic proportional type to allow feathering characteristics for smooth operation of any and all boom movements. The handles of the control valve shall be directly connected to the valve for full manual use of the controls when in the auxiliary hydraulic mode.

The display located in the pedestal cover shall include the following information:

- Low voltage (Red)
- Cab avoidance (Red)
- Joystick status
- All light switch options/status
- All warning information
- Engine status
- Transmission status
- Aerial status
- Jack status
- Monitor status (if available)
- Hydraulic pressure - indicates hydraulic pressure in use.
- Lower cylinder pressure – indicates pressure in the cap end of the boom lift cylinder.

Y\_\_N\_\_

# Town of Westbrook 0300 Bid Specifications: Aerial Ladder Truck

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## AERIAL OVERLOAD ALARM

An alarm horn and warning light shall be provided at the control pedestal and at the platform that shall sound to alert the operator should the load capacity of the aerial be exceeded. The alarm shall in no way restrict the further operation of the aerial. There shall be no exception to this safety requirement.

Y\_\_N\_\_

## AERIAL DEVICE FOOT PEDAL

A foot pedal shall be mounted on the turntable floor at the base of the control pedestal. Depressing the foot pedal shall activate the aerial hydraulic control valve for operating the aerial device from the turntable pedestal. Depression of the foot pedal also allows the pedestal operator to override the platform control.

Y\_\_N\_\_

## AERIAL ALIGNMENT LIGHT

There shall be a 4" round TruckLite model 4050A amber LED light recessed on the backside of the pedestal, viewable from the platform, to assist the operator's alignment of the aerial device with the aerial cradle.

Y\_\_N\_\_

## INCLINOMETER ON CAB DASH

An inclinometer shall be displayed on the cab info display to inform the driver if it is safe to deploy the outriggers. The inclinometer shall identify the truck angles on both the X and the Y axis in the form of bar graphs with degrees off center. It shall also show warning areas when the truck is located in a position that provides angles beyond those allowed for operation.

Y\_\_N\_\_

## AERIAL INTERCOM SYSTEM

The intercom shall be a Fire Research Model ICA-900 2 station with ACT clear voice sound system. The master shall be a push-to-talk station with 5-LED volume indicator lights and push button, arrow-up and arrow down, controls. The master unit shall be mounted on the turntable control pedestal. The hands free voice transmission slave unit shall be installed at the aerial tip or platform control console and always in transmit mode until interrupted by transmission from the master unit. The system stations shall be interconnected with IC-C-150 cable for static free operation in normal conditions.

Y\_\_N\_\_

# Town of Westbrook 0300 Bid Specifications: Aerial Ladder Truck

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## BOOM CONSTRUCTION

The boom shall be constructed of steel on the main stage and aluminum on the telescoping first, second, and third stages. It shall be a totally enclosed box type welded construction design or equivalent. It shall be able to withstand the stress of fully extended low angle positions combined with any positioning of full flow water stream capabilities

Teflon impregnated bearing pads shall provide a sliding surface for each section as it is extended or retracted. Wear pads shall have adjusting screws to set clearance without shims. The boom extension wear pads and boom pivot bushings shall not require grease.

Y\_\_N\_\_

## PLATFORM CONSTRUCTION

The platform structure shall be completely constructed of welded aluminum. Any tubular aluminum shall have a minimum diameter of 1.5" and any square aluminum shall be a minimum of 1.5" x 1.5". It shall have a 42" high hand railing. The floor shall be non-skid extruded aluminum with a minimum area of 15 sq. feet. A 4" minimum kickplate shall surround the floor. An aluminum plate for mounting the platform air and intercom shall be mounted at the left rear wall. Aluminum mounting angles for the platform control box shall be mounted on the right side.

There shall be two (2) curved aluminum doors with aluminum heat shields located on the front corners of the platform. The doors shall have a self-latching lock and shall swing inward. A secondary latch shall allow the door to swing in or out.

There shall be four (4) individual tie-off rings incorporated into the platform to be used as mounting points for safety harnesses. Two (2) rings shall be on each side at the rear of the platform.

The platform shall be fastened to the third telescoping boom section by means of an "L" shaped aluminum welded assembly. The attachment point shall be at center point under the platform to provide for greatest ease in leveling the platform.

The platform shall be provided with a non-skid tread walkway around the outside edge. The walkway shall be a minimum width of 8".

The construction of the platform being of aluminum and not painted steel shall reduce the maintenance cost of the platform.

Y\_\_N\_\_

# Town of Westbrook 0300 Bid Specifications: Aerial Ladder Truck

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## SKID RESTS

A set of poly skid rests shall be located underneath the platform to protect mounted items from damage when the platform is set on the ground or a flat surface.

Y\_\_N\_\_

## PLATFORM CONTROL STATION

A control station shall be located on the right side rear corner of the interior of the platform. The control station shall be constructed of aluminum.

Y\_\_N\_\_

## CONTROL STATION LIGHTING

A Whelen OAC0EDCR clear LED light shall be installed under the platform control joystick.

Y\_\_N\_\_

# Town of Westbrook 0300 Bid Specifications: Aerial Ladder Truck

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## PLATFORM CONTROLS

A single joystick control shall provide simultaneous operation of all three (3) boom movements. The control shall be a self-centering handle with an integral trigger type safety interlock switch. This switch shall work in conjunction with the safety interlock system at the main pedestal. The joystick control shall send a variable signal to the hydraulic valve at the main pedestal for the desired movements. It shall be mounted on the right rear corner of the platform so as to not interfere with any activities in the platform. It shall also allow constant observation of any obstacles due to directional hand movement without looking at the control.

The control shall be activated by turning on the platform control's switch at the main pedestal. It shall be deactivated by pushing the platform control switch "off" or by depressing the safety interlock foot pedal.

The platform joystick shall have 3 colored LED's with a speed control push-button. Pressing the button one time shall give a creep speed and the LED shall turn red. Pressing the button again, gives ½ normal speed and the LED turns yellow. Pressing the button again, gives normal speed and the LED changes to green. Pressing the button again returns the speed to creep with a LED color of red. Moving the joystick to center shall slowly reduce speed to zero. All speeds can be adjusted at final inspection to meet departmental requirements.

The control panel shall have the following switches:

- Basket Spot Lights (Boom & Stream Tracking)
- Basket Flood Lights (Optional)
- Basket Work Lights (Optional)
- Basket Warning Lights (Optional)

The control panel shall have the following indicator lights:

- Boom Overload Alarm
- Cab Avoidance Active
- Boom Aligned
- Must Use Manual Leveling
- Auto High Idle Active

Y\_\_N\_\_

## DISPLAY TRAINING MODE PROGRAM

The display at the pedestal (and platform if selected) shall be programmed for training capabilities. When so programmed, the operator at the pedestal shall be able to override the platform controls and speed. Training mode shall provide safety precautions not available in normal mode, such as not being able to rotate or lower the platform into the cab. This programming shall also allow for selection of slowed and delayed reaction time of the boom/ladder.

Y\_\_N\_\_

## PLATFORM LEVELING SYSTEM

# Town of Westbrook 0300 Bid Specifications: Aerial Ladder Truck

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The platform leveling system shall incorporate an electronic level sensing device that controls a proportional hydraulic valve. This system shall be capable of leveling the forward/rearward tilt of the platform regardless of the truck orientation. Leveling shall also be functional with the auxiliary back-up hydraulic system.

Hydraulic lines shall connect to a proportional control hydraulic valve. The output of an electronic level sensing device controls the proportional valve to position the leveling cylinders and maintain level of the platform. The two (2) leveling cylinders shall be mounted at the rear of the platform. These cylinders shall have a minimum rod size of 1.75" and incorporate dual pilot operated holding valves so as to hold them in place. An individual cylinder shall be capable of holding the weight of the platform, if necessary.

Y\_\_N\_\_

## PLATFORM WATERWAY SYSTEM

A mounting flange for a deck gun shall be mounted in the front center of the platform structure. The waterway shall also be equipped with a manually operated 4" 150# flange "slo-close" worm gear shut-off valve mounted in the front center portion of the platform for a deck gun, 2000 GPM capacity and a 4" 150# flange base.

A water curtain assembly shall be mounted beneath the platform for protection. It shall be operated by a shut-off valve.

Y\_\_N\_\_

## DISCHARGE

There shall be one (1) 2.5" coupling provided for one (1) 2.5" gated valve with cap in the waterline at the front center portion of the platform, under the discharge gun flange of the platform for an optional hand line set-up.

Y\_\_N\_\_

## AERIAL WATER SYSTEM

The aerial waterway shall be 5" schedule 40 aluminum pipe from the swivel to the telescopic waterway. A single aluminum telescopic waterway, which has been duranodic hard coat anodized inside and out (meeting MIL-A-8625), shall be provided and mounted to the side of the aerial boom. The telescopic waterway shall consist of a 4.75" I.D. base section tube, 4.25" I.D. second section tube and a 3.75" ID third section tube, and a 3.25" I.D. fly section tube. The waterway shall be 4" schedule 40 aluminum from the telescopic waterway to the platform waterway. The aerial waterway shall connect to the platform waterway with a 4" Victaulic coupling.

Y\_\_N\_\_

## FORWARD BODY

# Town of Westbrook 0300 Bid Specifications: Aerial Ladder Truck

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A forward body module shall be provided between the back of the cab and the aerial superstructure. The forward body module shall house the outrigger controls and overrides, the waterway inlets/discharges, gauges and valves, as well as the turntable access steps.

A waterway inlet panel constructed of 14 gauge brushed 304 stainless steel shall be located just in front of the superstructure on both sides of the apparatus. All applicable waterway inlets/discharges, drains, gauges and controls shall be located on these panels.

On the left side of the forward body module, ahead of the waterway inlet panel, shall be a set of turntable access steps and handrails. Where applicable, Gripstrut shall be used in the construction of the stepping surfaces. There shall be two (2) compartments stacked vertically just aft of the cab. The upper compartment shall be recessed back from the outside edge of the body and shall house the outrigger stabilizer controls. The lower compartment shall extend out to approximately the width of the cab and shall have a "Gripstrut" stepping surface on top. The lower compartment shall be have a door frame to door frame measurement of 19.625" wide x 15.375" high, a clear door opening of 18" wide x 15.375" high and usable space of 21.875" wide x 17" high x 18.875" deep.

On the right side of the forward body module, ahead of the waterway inlet panel, there shall be an open storage area without a door. This area, painted job color, shall measure 30.5" high x 20.25" wide x 17.75" deep. The back corner shall be angled to give clearance for the exhaust. If right side outrigger controls or a right side discharge is selected for this location, the dimensions of this area shall be affected. There shall be no access to the turntable from this area.

The top of the forward body section shall be covered with 1/8" aluminum treadplate. Each compartment shall have a vertically hinged, lap type, double panel construction stainless steel door.

Y\_\_N\_\_

# Town of Westbrook 0300 Bid Specifications: Aerial Ladder Truck

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## WATERWAY INLETS

A 5" inlet shall be provided on the each side of the vehicle. All inlet piping below the swivel shall be stainless. Each inlet shall be trimmed with 14-gauge brushed stainless steel garnish rings. The inlets shall each have a 5" manually operated butterfly valve.

There shall be a 1-1/2" drain valve provided. The drain shall be recessed behind the streetside panel with the control extending through the panel and located along the bottom. The drain control shall be properly labeled. The water discharged from the drain shall be routed so it drains below the chassis frame rails.

A 3/4" Auto Drain shall be provided as well to drain water after the system pressure is released. This drain shall remain open until the system is pressurized again.

A 2-1/2" intake relief valve shall be permanently installed in the inlet piping. It shall have minimum pressure adjustment of 75 to 250 psig. The surplus water shall be plumbed to the underside of the truck away from components and the operator.

Y\_\_N\_\_

## LEFT SIDE WATERWAY INLET FITTINGS AND CAPS

### WATERWAY ADAPTER

A 5"FNPT X 5" MNST straight chrome plated brass rocker lug adapter shall be provided for the waterway.

Y\_\_N\_\_

### WATERWAY ELBOW ADAPTER

A 5" MNST X 5" Storz straight hard anodized aluminum 30 degree elbow shall be provided for the waterway.

Y\_\_N\_\_

## RIGHT SIDE WATERWAY INLET FITTINGS AND CAPS

### WATERWAY ADAPTER

A 5"FNPT X 5" MNST straight chrome plated brass rocker lug adapter shall be provided for the waterway.

Y\_\_N\_\_

### WATERWAY ELBOW ADAPTER

A 5" MNST X 5" Storz straight hard anodized aluminum 30 degree elbow shall be provided for the waterway.

Y\_\_N\_\_

## PRESSURE/FLOWMETER

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An FRC model FPA-400-X waterproof dual pressure and flow meter combination gauge shall be installed at the aerial operators pedestal position and shall display pressure and flow readings simultaneously. Devices that require user intervention such as pushing buttons to change the mode from pressure to flow shall not be acceptable. Sensors that transmit the pressure and flow data shall be separate and independent. The sensor used to measure flow shall be of the paddlewheel design. The paddlewheel shall be proved in fire service applications with a minimum of 1000 units in service over 5 years. The magnets shall not be mounted on the paddles. The 0.4" high (minimum) flow meter display shall be "daylight bright" LED, visible even in direct sunlight. The pressure display shall be needle type with 250 degree electric movement.

Y\_\_N\_\_

## GATED SIAMESE WITH INLET PLUGS

Two (2) Akron Brass style 1583 suction siameses shall be provided. The siamese shall have (2) 2.5"NH female inlets and (1) 5" Storz outlet. It shall be constructed of lightweight Pyrolite. Quarter turn valves with self-locking Tork-Lok handles shall provide a positive shutoff and easier operation. Both inlets shall have a strainer. The siamese shall have a drain and adjustable seats. Two (2) 2.5" chrome plated brass plugs shall be provided for the inlets.

Y\_\_N\_\_

## MONITOR

An Akron Apollo model 3426, stick controlled monitor shall be located in front of the fixed center portion of the bucket between the doors. An Akron plain deluge tip, model 489 and a discharge pipe, Akron 3488, shall also be provided.

The entire water system shall be capable of delivering 1250 gallons per minute at any angle of elevation, up to full extension. The monitor can go 45 degrees above and below the horizontal.

Y\_\_N\_\_

## AERIAL TRACKING LIGHT(S)

One (1) Whelen PAR36 chrome plated Super-LED flood light(s), with 12 diodes (1.70 amp), shall be installed on the base section of the aerial device near the outer end of the base section to illuminate the aerial device in any position of operation.

Aerial Base Light shall be mounted on the left side of the aerial device.

Y\_\_N\_\_

# Town of Westbrook 0300 Bid Specifications: Aerial Ladder Truck

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## AERIAL LIGHT SWITCH(ES)

One (1) 12 volt aerial light(s) shall be switched at the turntable pedestal and the platform controls using momentary contact switches and a relay. This shall allow the lights to be turned on or off from either location as long as the lighthouse on/off switch (if provided) is in the "on" position.

Y\_\_N\_\_

## STREAM TRACKING LIGHT(S)

One (1) Whelen PAR36 chrome plated Super-LED floodlight(s), with 12 diodes (1.70 amp) shall be installed on the forward face of the platform near the bottom so as to allow the operator to observe the effect of the stream from the monitor nozzle.

Platform light shall be mounted on the left side of the platform.

Y\_\_N\_\_

## AERIAL LIGHT SWITCH(ES)

One (1) 12 volt aerial light(s) shall be switched at the turntable pedestal and the platform controls using momentary contact switches and a relay. This shall allow the lights to be turned on or off from either location as long as the lighthouse on/off switch (if provided) is in the "on" position.

Y\_\_N\_\_

## TELESCOPIC POLE MOUNT SCENELIGHT ON REAR OF PLATFORM

One (1) FRC model 542, side mounting, pull-up, telescopic pole shall be installed on the outside of the platform, at the rear on the driver's side.

One (1) FRC "Spectra" SPA100-Q15, 12 volt, 13.0 amp, 15,000 lumen LED lighthouse(s) shall be provided. The lamphead shall have sixty (60) ultra-bright white LEDs, 48 for flood lighting and 12 to provide a spot light beam pattern. The lamphead angle of elevation shall be adjustable at a pivot in the mounting arm and the position locked with a round knurled locking knob. The lamphead shall be no more than 5-3/8" high by 14" wide by 3-3/4" deep and have a heat resistant handle.

Y\_\_N\_\_

## AERIAL LIGHT SWITCH(ES)

One (1) 120 volt aerial light(s) shall be switched at the turntable pedestal and the platform controls using momentary contact switches and a relay. This shall allow the lights to be turned on or off from either location as long as the lighthouse on/off switch (if provided) is in the "on" position.

Y\_\_N\_\_

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## LIGHTHEAD AND BRACKETS FINISH

One (1) FRC lighthead(s) and light mounting bracket(s) shall have a white powder coat finish.

A pair of side mount brackets with a 2.75" offset shall be provided to mount two (2) telescopic pole(s) to the apparatus.

Y\_\_N\_\_

## TOWER ELECTRICAL CORD REELS

Two (2) steel electrical cord reels, with automatic spring rewind, shall be installed on the main boom section.

Y\_\_N\_\_

## TOWER HYDRAULIC HOSE REEL

A steel hydraulic hose reel, with automatic spring rewind and stainless steel disc, shall be installed on the main boom section.

Y\_\_N\_\_

## BREATHING AIR SYSTEM WITH HOSE REEL

A breathing air system shall be provided. The system shall be composed of one (1) 509 cubic feet, 6000 PSI air cylinder and two (2) breathing air stations, one (1) 50 foot hose for refilling the air cylinder, two (2) gauge panels and one (1) painted hose reel.

The air cylinder shall be mounted to the base section of the aerial device, mounted the same side as the pedestal. The cylinder shall connect to a "T" that delivers high pressure to the gauge panel at the turntable and the panel at the platform. All hose shall meet NFPA requirements for breathing air.

The breathing air stations shall be located at the turntable pedestal and at the platform. The station on the turntable pedestal shall be equipped with a complete set of quick connect fittings for one (1) person. The station on the platform shall be equipped with a manifold and quick connect fittings for three (3) people.

There shall be two (2) gauge panels; one next to the air bottle and one on the platform. The gauge panels shall include the following: an air supply pressure gauge, a pressure regulator, a regulated pressure gauge, a low pressure alarm and indicator light when air is below 20%. The panel by the turntable pedestal shall have a system fill valve. Both panels shall be the location for a digital air minder system.

The air bottle shall be factory painted yellow as received from the manufacturer.

Y\_\_N\_\_

# Town of Westbrook 0300 Bid Specifications: Aerial Ladder Truck

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## BREATHING AIR LEVEL MONITORING SYSTEM

The apparatus shall be equipped with a Class I "Air Minder" system to give a visible indication of the air remaining in the breathing air system. The system shall also provide a visual and audible warning when the level becomes too low.

The Air Minder system shall include:

1. A weatherproof pressure transducer mounted in the air line between the air bottles and the high pressure regulator.
2. A remote display mounted on the turntable control pedestal. This display shall consist of a weatherproof housing with a black non-reflective bezel and a bright red LED readout (readable in sunlight), scaled 0 to 100, and labeled "% Air Remaining". The display shall incorporate a low pressure warning circuit, which causes the display to flash when 20% maximum air bottle capacity remains in the air system and sounds an audible alarm when the remaining air level drops to 10% of maximum air bottle capacity.
3. Appropriate wires and connectors to hook up the display to the pressure transducer and to the vehicle's 12 volt electrical system.
4. An audible horn mounted near the display.

An automatic low pressure switch mounted near the display will turn off the power to the Air Minder warning horn when the supply line pressure drops below 5 PSI.

Y\_\_N\_\_

## LIFTING EYE

A lifting eye if applicable, shall be mounted to the bottom of the main stage boom as close to the end as feasible. A plaque shall be installed on each side of the boom stating the lifting capacity of the eye. The lifting eye shall have a capacity of 5,000 pounds. This lifting eye shall only be used when the boom is fully retracted, the waterway completely void of any water and no personnel are in the platform.

Y\_\_N\_\_

## LIFTING EYES

Two (2) lifting eyes if applicable, made of 1" aluminum rod shall be welded to the bottom of the platform "L" bracket. These eyes shall each have a capacity of 500 lb and a combined capacity of 1000 lb. A plaque shall be installed stating the lifting capacity of these eyes. Both lifting eyes must be used when carrying an item so as to evenly distribute the weight on the platform and boom section. Any weight picked up by these lifting eyes must be calculated as part of the overall platform weight capacity.

Y\_\_N\_\_

## PLATFORM STOKES MOUNTING BRACKETS

# Town of Westbrook 0300 Bid Specifications: Aerial Ladder Truck

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The platform shall be equipped with the necessary brackets and hardware to hold a stokes basket centered over the discharge gun. These brackets shall be removable and shall be normally stored in a compartment or on top of the truck. The brackets shall be used at the fire or emergency scene and shall not be used for carrying the stokes basket while in transit.

Y\_\_N\_\_

## PLATFORM HOSE BIN

A hose bin designed to hold approximately twenty feet (20') of 1-3/4" attack hose shall be installed on the walkway at the front of the platform centered underneath the monitor. The bin shall have a fold down door to allow for easy discharging of the hose. The floor of the bin shall be lined with Mateflex. A 2-1/2" gated valve shall also be installed to supply water to this hose line.

Y\_\_N\_\_

## PLATFORM TOOLBOX

One (1) toolbox shall be provided to the rear of the platform on the right side. The box shall be constructed of aluminum treadplate and have a cover. The interior dimensions shall be approximately 15.75" x 13.00" x 24.00" deep.

Y\_\_N\_\_

## HYDRAULIC GENERATOR

A Harrison 10.0 kW hydraulic generator system shall be provided installed on the apparatus. There shall be a generator enable switch installed on the cab dash. The system shall be capable of producing the nominal output power of 10.0 kW, 120V/240V, single phase, 60 Hz. The generator shall be installed per the manufacturer recommendations and shall be capable of supplying full power during all engine speeds or operation modes.

The generator shall be placed in a tray frame assembly which affords protection to the components and provides a unitized mounting module containing the motor/generator, reservoir, oil cooler, filtration system, and a manifold containing a cross-port check valve plus system relief valve. The generator shall be a commercial type with a heavy-duty bearing and of brushless design to ensure low maintenance. The reservoir shall include an oil level gauge, oil temperature gauge, fill cap, fill strainer, and a boost unit to provide a positive pressure to the pump suction port. The reservoir shall be equipped with a remote drain and valve below the framrails. The generator and hydraulic motor shall be close coupled and permanently aligned using a Morse taper with a through bolt to secure the motor to the generator.

The PTO driven hydraulic pump and motor shall be of axial piston design to provide low internal leakage and a high degree of frequency stability. The pump will match to the system with the proper orifice, pressure compensator and load sensing to provide a stable output over the rated speed range of the pump and with electrical loads from no load to full-load. The PTO ratio shall be selected to allow operation throughout the entire engine RPM range; idle to full throttle.

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A display meter consisting of (4) numeric LED displays shall be used. The meter shall simultaneously display system voltage, frequency and amperage in each of the two 120V legs. A high temperature visual alarm shall be provided and installed.

When properly installed, the system shall be warranted by the manufacturer for a period of not less than two years or two thousand hours, which ever should come first.

Y\_\_N\_\_

## GENERATOR TEST AND CERTIFICATION

The generator/inverter shall be third party tested at the manufacturer's facility and shall conform to NFPA requirements and standards. Copies of all tests shall be provided with the delivery documentation.

Y\_\_N\_\_

## BREAKER BOX

A twelve (12) place Square D brand, or approved equal, gray colored breaker box shall be provided and installed in the front upper left hand side compartment. Manual reset circuit breakers, matching the rated output of each specific outlet or device, shall be provided. All power supply assembly conductors, including neutral and grounding conductors from the line voltage power source to the circuit breaker box shall have an equivalent amperage rating and shall be sized to carry not less than 115 percent of the amperage of the nameplate current rating of the power source. Power supply conductors shall be run in nonmetallic liquid tight flexible conduit or type SO/SEO cord with a WA suffix. Conduit shall have a temperature range of -67°F (-55°C) to 221°F (105°C). Wiring conductors from the circuit breaker box to the individual outlets and devices shall be sized in accordance with NFPA 70, *National Electrical Code* requirements. Branch circuit wiring conductors shall be run in (1) metallic or nonmetallic liquid tight flexible conduit rated for use in a temperature range of -67°F (-55°C) to 221°F (105°C) with stranded copper wire rated for wet locations and temperatures not less than 194°F (90°C) or (2) Type SOW, SOOW, SEOW, or SEOOW flexible cord, rated at 600 volts and at temperatures not less than 194°F (90°C). A power source specification label shall be permanently attached to the apparatus near the operators control panel.

The hydraulic generator shall be located in the open bin on top of the body near the boom support.

Y\_\_N\_\_

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## RECEPTACLE(S)

Two (2) 120 volt 3-wire twist lock receptacle(s) shall be provided and installed in weatherproof boxes with spring loaded covers.

Location of each 120V receptacle shall be: In compartments forward of the rear wheels, one (1) each side.

NEMA type (number) of each connection shall be:  
(and location if different amperages are required)

L5-15R(15 Amp) [Twistlock](#)

L5-20R(20 Amp) [Twistlock](#)

L5-30R(30 Amp) [Twistlock](#)

Y\_\_N\_\_

## 120 VOLT SHORELINE POWERED RECEPTACLE IN BODY COMPARTMENT(S)

A 120-volt, 20 amp, 3-wire receptacle shall be provided inside four (4) body compartment(s) in accordance with NFPA guidelines. A brushed stainless steel coverplate shall be provided to protect the receptacle. The receptacle shall be powered by the shorepower inlet and labeled accordingly.

The receptacle(s) shall be located: Rearmost body side compartments, two (2) each side.

NEMA type (number) of each connection (and location if different amperages are required):

5-20R (20 Amp) [Non-twistlock](#) duplex receptacle

L5-20R (20 Amp) [Twistlock](#)

Y\_\_N\_\_

## 120 VOLT SHORELINE POWERED RECEPTACLE(S) IN CAB INTERIOR

One (1) 120-volt, 20 amp, 3-wire receptacle(s) shall be provided in the cab interior in accordance with NFPA guidelines. A brushed stainless steel coverplate shall be provided to protect the receptacle. The receptacle shall be powered by the shorepower inlet and labeled accordingly.

Y\_\_N\_\_

# Town of Westbrook 0300 Bid Specifications: Aerial Ladder Truck

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## CORD REEL(S)

Two (2) Hannay Model ECR1618-17-18 power rewind cord reel(s) for live electric cable shall be provided. The reel(s) shall be 12 volt electric rewind and be equipped with an electrical collector ring with a minimum #10 gauge, 3-conductor wiring. Capacity of each reel shall be a minimum of 200 feet 10/3 gauge or 250 feet of 12/3 gauge electric cable.

The cord reels shall be located on the ceiling of the rearmost body side compartments, one (1) each side.

Y\_\_N\_\_

## CORD REEL CABLE(S)

Two (2)200 foot length(s) of 10/3 type SO electric cable shall be provided and installed on the cord reel.

Y\_\_N\_\_

## HOSE ROLLER ASSEMBLY

Cable reel shall be equipped with a captive roller assembly mounted directly on reel frame. It shall be supplied by Hannay and have a 4-way roller assembly with stainless steel rollers mounted in a stamped steel housing.

Y\_\_N\_\_

## CABLE STOP

A molded plastic spherical type stop shall be provided near the end of the cable. It shall prevent damage to the electrical plug or connection when the reel is rewound. Stop shall be drilled for the correct cable size. It shall be a two piece design that clamps over the cable by tightening two bolts. Bolts shall be recessed into the ball to keep them from damaging the roller assembly when it is fully retracted.

Y\_\_N\_\_

## TWIST-LOCK FEMALE PLUG(S) ON CORD REEL CABLE

Two (2) Hubbell model HBL2313SW 120V/20A heavy duty twist-lock female plug(s) with watertight safety-shroud and Insulgrip connector body shall be provided. The plug(s) shall be installed on the working end of the cord reel cable(s).

Y\_\_N\_\_

# Town of Westbrook 0300 Bid Specifications: Aerial Ladder Truck

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## ELECTRICAL JUNCTION BOX

An Akron Brass 4-receptacle junction box shall be provided for distribution of electrical power on the fire ground. The box shall be constructed of aluminum and shall be completely powder coated in high visibility yellow with gray hinged protective receptacle covers and the full length carry handle. Internally lighted faceplates shall provide sufficient light to make connections and alert the crew that the box is in "power-on" status. The junction box shall have dimensions of 9.25" long x 5.5" wide x 8.5" high. The box shall be equipped with a 12-inch pigtail with a wire mesh cord grip and a L5-20 connection.

A total of four (4) single receptacles shall be provided; two (2) NEMA L5-20R Twist Lock and two (2) NEMA 5-20R Household, Straight Blade. Each receptacle shall be rated for 20 amps at 125 Volts.

A mounting box shall be provided for the junction box.

Y\_\_N\_\_

## CAB FRONT BROW MOUNT SCENELIGHT(S)

One (1) FRC model 807 mount(s) shall be installed on the cab front brow.

[The SPA807 mount shall be on the center of the cab front brow.](#)

One (1) FRC "Spectra" SPA100-K20, 120 volt AC, 2 amp, 20,000 lumen LED lighthouse(s) shall be provided. The lamphead shall have sixty (60) ultra-bright white LEDs, 48 for flood lighting and 12 to provide a spot light beam pattern. The lamphead angle of elevation shall be adjustable at a pivot in the mounting arm and the position locked with a round knurled locking knob. The lamphead shall be no more than 5-3/8" high by 14" wide by 3-3/4" deep and have a heat resistant handle.

One (1) 120 volt light(s) shall be switched at the cab dash.

Y\_\_N\_\_

## LIGHTHEAD AND BRACKETS FINISH

One (1) FRC lighthouse(s) and light mounting bracket(s) shall have a black powder coat finish.

Y\_\_N\_\_

# Town of Westbrook 0300 Bid Specifications: Aerial Ladder Truck

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## CAB SIDE BROW LAMP MOUNTS

Two (2) FRC "Spectra" model SPA850 mounts shall be installed on the cab side brows, one on each side.

Two (2) FRC "Spectra" SPA100-K20, 120 volt AC, 2 amp, 20,000 lumen LED lighthouse(s) shall be provided. The lamphead shall have sixty (60) ultra-bright white LEDs, 48 for flood lighting and 12 to provide a spot light beam pattern. The lamphead angle of elevation shall be adjustable at a pivot in the mounting arm and the position locked with a round knurled locking knob. The lamphead shall be no more than 5-3/8" high by 14" wide by 3-3/4" deep and have a heat resistant handle.

Two (2) 120 volt light(s) shall be switched at the cab dash.

Y\_\_N\_\_

## LIGHTHEAD AND BRACKETS FINISH

Two (2) FRC lighthouse(s) and light mounting bracket(s) shall have a black powder coat finish.

Y\_\_N\_\_

## CAB SURFACE MOUNT SCENELIGHT(S)

Two (2) surface light mount(s) for Fire Research Spectra 900 lamphead(s) shall be installed on the cab.

Cab surface mount shall be located above the cab side access doors, one (1) each side.

Two (2) FRC "Spectra" SPA900-Q65, 12 volt, 6.0 amp, 4,600 lumen LED lighthouse(s) shall be provided. The lamphead shall have twenty-four (24) ultra-bright white LEDs. The lamphead shall be 6-3/4" high by 9" wide and have a profile of less than 1-3/4" beyond the mounting surface. The lamphead housing shall be aluminum with a chrome colored bezel.

Two (2) 12 volt light(s) shall be switched at the cab dash.

Y\_\_N\_\_

# Town of Westbrook 0300 Bid Specifications: Aerial Ladder Truck

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## GROUND LADDERS

Ladders shall be provided in full compliance with NFPA 1901 requirements for aerial trucks. Ladders shall be individually mounted under the open equipment area inside of the torque box and properly labeled. One hundred fifty-eight (158) feet of Alco-Lite ladders shall be provided as follows:

- |                          |                |
|--------------------------|----------------|
| -Two 35 ft., 2-Section   | - Model PEL-35 |
| -One 28 ft., 2-Section   | - Model PEL-28 |
| -One 10 ft., Folding     | - Model FL-10  |
| -One 20 ft., Roof        | - Model PRL-20 |
| -One 16 ft., Roof        | - Model PRL-16 |
| -One 14 ft., Combination | - Model CJL-14 |

Y\_\_N\_\_

## LADDER BAYS

Two (2) additional ladders bays shall be provided, one on each side of the torque box. The bay on the right shall be capable of holding up to a 20 foot ladder, the bay on the left shall be capable of holding up to a 16 foot ladder. Ladders stored in the side ladder bays shall be accessed through the main ladder compartment doors.

Y\_\_N\_\_

## LADDER COMPARTMENT DOORS

Smooth aluminum double doors shall be provided at the rear of the ground ladder compartment. The doors shall be of double panel construction and shall be held open with a door holder and shut with a "D" ring with 2-point rod locks. The primary door shall lap the secondary door and the compartment lights shall be activated when the primary door opens. The door switch shall be integrated with the door ajar hazard warning system.

Y\_\_N\_\_

## LADDER BAY LIGHTS

The ladder bay opening shall be illuminated by two (2) LED lights from Triton, model TLPC or equivalent. Each weatherproof light shall have 15 LED bulbs and a lens that measures 1.125" in diameter. The lights shall be activated by opening the ladder bay doors. The door switch shall be integrated into the door ajar hazard warning system.

Y\_\_N\_\_

# Town of Westbrook 0300 Bid Specifications: Aerial Ladder Truck

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## PIKE POLE(S)

One (2) 6 ft. Fire Hooks Unlimited APH-6 pike pole(s) shall be provided. The handles shall be solid fiberglass with stainless steel wear sleeves. There shall be a gas shutoff on the end of the pole opposite the hook.

Y\_\_N\_\_

## PIKE POLE(S)

Two (2) 10 ft. Fire Hooks Unlimited APH-10 pike pole(s) shall be provided. The handles shall be solid fiberglass with stainless steel wear sleeves. There shall be a gas shutoff on the end of the pole opposite the hook.

Y\_\_N\_\_

## PIKE POLE(S)

Two (2) 12 ft. Fire Hooks Unlimited APH-12 pike pole(s) shall be provided. The handles shall be solid fiberglass with stainless steel wear sleeves. There shall be a gas shutoff on the end of the pole opposite the hook.

Y\_\_N\_\_

## PIKE POLE(S)

One (2) 14 ft. Fire Hooks Unlimited APH-14 pike pole(s) shall be provided. The handles shall be solid fiberglass with stainless steel wear sleeves. There shall be a gas shutoff on the end of the pole opposite the hook.

Y\_\_N\_\_

## ROOF HOOK(S)

Two (2) 6 ft. Fire Hooks "NY" fire hook(s) with handle(s) shall be provided.

Y\_\_N\_\_

## PVC PIKE POLE MOUNT(S)

Eight (8) PVC tube(s) shall be mounted to facilitate storage of pike poles.

The mounting tube(s) shall be located in the ground ladder compartment.

Y\_\_N\_\_

## WHEEL CHOCKS

Four (4) Worden HWG wheel chocks shall be furnished and shipped loose by the apparatus manufacturer. Four (4) U815 holders shall be installed by the manufacturer, one in front of and one behind the rear wheel(s) on both sides of the body.

Y\_\_N\_\_

# Town of Westbrook 0300 Bid Specifications: Aerial Ladder Truck

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## TOUCH UP PAINT

A quart of touch up paint shall be supplied with the vehicle.

Y\_\_N\_\_

## PROCESSES

The following processes shall be employed in the finishing of the apparatus:

Manual Surface preparation – All metal surfaces on all custom body and cabs shall be thoroughly cleaned and prepared for paint. Surfaces that shall not be painted include all chrome plated, polished stainless steel and bright aluminum tread plate. As required, weld seams and other areas shall be caulked to prevent water leaks or for appearance reasons. Each imperfection on the exterior metal surface shall be removed or filled and then sanded for a smooth flat appearance.

Chemical Cleaning and Treatment – All painted surfaces shall be washed with a chemical degreaser, cleaner and surface conditioner to allow for proper adherence of primer coat. Then they shall be washed with a neutralizer product. All products used are approved by paint supplier and applied under strict process control to meet performance requirements on corrosion prevention and chip resistance.

Primer/ Surface Coating for Top Coat application – a minimum of 2 coats of Epoxy based primer shall be applied to surfaces inside and outside of cabs and bodies and all other parts of apparatus that shall receive a Top color coat to achieve required corrosion protection. After that a minimum of 2 coats of sealer shall be applied over the primer surface. The overall thickness of the primer/sealer coat shall be between 3 to 8 mils wet. Once dried and cured all surfaces that shall receive a top coat shall be hand sanded to achieve a flat and smooth surface to meet gloss and other paint quality standards. All products used are approved by paint supplier and applied under strict process control to meet performance and appearance requirements. The underside of the cab and body shall be finished with one coat of epoxy primer specifically designed for this application to prevent corrosion and provide chip resistance to typical paved road conditions.

Top Coat Application – Each Top Coat final color on the apparatus is applied using a two stage paint process. The unit shall be thoroughly hand cleaned to eliminate dust residues and to detect any imperfection in the surfaces to be painted. A fast drying 3.5 VOC polyurethane basecoat color shall be applied using a cross coat application technique. Additional coats may be applied as required until the coat thickness reaches 2.0 to 6.0 mils wet and a full hide appearance. If a second color is required, proper masking shall be applied to the unit and the basecoat application process shall be repeated for the second color. A slow drying low VOC High Build clear coat shall be applied using a cross coat application technique until a minimum of 5.0 mils wet is achieved. The unit is then properly heated to assure flash and cure of the paint before leaving the paint booth. All products used are approved by paint supplier and applied under strict process control to meet performance and appearance requirements. Each batch of color topcoat shall be tested for precise color match following paint supplier color matching process. A visual color match shall be checked prior to paint using customer approved paint chips.

# Town of Westbrook 0300 Bid Specifications: Aerial Ladder Truck

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The cab and body shall be primed and finish painted prior to installation on the chassis to ensure paint coverage in all areas including the difficult to reach places. The exterior and interior of the cab shall be finish painted before the doors are installed or any assembly is started to ensure a finish painted surface beneath all trim items.

Primer/ Surface Coating for Single Coat application – a minimum of 2 coats of Epoxy based primer shall be applied to all surfaces of the apparatus that shall receive a single color coat to achieve required corrosion protection. This is a wet coat process and it shall achieve a 3.0 to 8.0 mills wet thickness and complete coverage of all bare metal. All products used are approved by paint supplier and applied under strict process control to meet performance and appearance requirements.

Single Coat Application – A minimum of 2 coats of direct gloss paint shall be applied over all primed surface to achieve corrosion protection and appearance. This application shall be used for Gloss Black, Job Color and Color finishes in parts of the apparatus such as frame rails, outriggers, ladders and other aerial devices, suspension and other chassis parts, etc. as defined in the sales order.

Zolatone Coat Application – All areas to receive a Zolatone coat shall be primed following the primer/surface coating for top coat application. A high pressure coat of Zolatone paint shall be applied in a cross pattern technique to achieve smooth finished surface. A second low pressure coat of Zolatone paint shall be applied in a single pattern to achieve a textured appearance.

Zolatone Clear Coat Application – Starting with a completed and dry Zolatone coat application 2 to 3 coats of Zolatone clear coat shall be applied until a thickness of 5.0 mills wet is achieved.

## PAINTERS

All painters shall be paint supplier certified. They shall be re-certified periodically in order to keep up to current standards and procedures required by the coatings manufacturer. This certification is performed independently by the paint supplier.

Y\_\_N\_\_

## FACILITY

The finishing facility shall be certified independently by the paint supplier by meeting or exceeding its extensive and stringent requirements. The paint facility shall be audited quarterly by the paint supplier to ensure proper equipment, procedures and safety regulations are being used and adhered to.

Y\_\_N\_\_

# Town of Westbrook 0300 Bid Specifications: Aerial Ladder Truck

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## QUALITY STANDARDS

The finish quality and appearance shall be in accordance with the paint quality standards for dirt, gloss, reflectivity, clarity and depth of image. The standard is available to the customer at any time upon request.

Y\_\_N\_\_

## FRAME & UNDERCARRIAGE FINISH

The following items shall have an additional coat of gloss black paint applied over the primed surface as supplied by the component manufacturer. Single coat application process shall be used to apply Gloss Black direct gloss paint on the parts identified below:

Chassis frame rails, cross members.

Front bumper extension.

Front & rear axles and suspension.

Battery boxes.

Fuel tank and fill tube.

Air reservoir tanks.

Pump module mounting brackets.

Body mounting brackets.

Steering gear box and steering link arm.

Drive shafts.

The following items will be furnished with the finish as provided by their respective manufacturer.

Engine, transmission and accessories.

Exhaust system.

Retarder (when furnished).

PTO & hydraulic pump (when furnished).

Cab lift cylinders & hydraulic pump.

Shock absorbers.

Fuel filter.

Air drier and air cleaner.

# Town of Westbrook 0300 Bid Specifications: Aerial Ladder Truck

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Electrical wiring and loom.

Air brake lines, valves and mounting brackets.

Y\_\_N\_\_

## CAB INTERIOR PAINT FINISH

The inside of the cab shall be painted with black Zolatone paint following the Zolatone Coat application process.

The following components shall be painted:

Exposed interior surfaces of the cab structure

Exposed interior surfaces of the driver/officer/crew doors

All interior "Metal" access/wire covers of the cab

Head bumper brackets

Miscellaneous brackets, if present: camera mounts, non-recessed radios, charger covers.

Y\_\_N\_\_

## PAINT INSIDE OF CAB

The inside of the full tilt cab shall be clear coated following the Zolatone Clear Coat application process in the same components that received a Zolatone application.

Y\_\_N\_\_

## TWO TONE CAB PAINT

The cab shall be two tone painted with the paint break just below the windshield. The paint shall follow the Top Coat application process for two colors.

Y\_\_N\_\_

A decorative molding shall separate the two colors around the cab. The paint break shall be horizontal across the front of the cab above the wipers and taper down with a radius even with the outside corners of the grille.

Y\_\_N\_\_

## BODY PAINT, SINGLE COLOR

The body of the apparatus shall be painted to match the primary cab color. The paint shall follow the Top Coat application process for a single color.

Y\_\_N\_\_

# Town of Westbrook 0300 Bid Specifications: Aerial Ladder Truck

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## FORWARD BODY COMPARTMENT PAINT

The forward body compartment exterior shall be painted job color following the Top Coat application process for a single color. The interior of the compartments shall be painted gray Zolatone following the Zolatone Coat application process.

Y\_\_N\_\_

## ACORN NUTS

Acorn nuts shall be installed on all exposed screws and bolts in areas where personal injury may result and/or damage to equipment may occur. For further details, please refer to the enclosed standards document.

Y\_\_N\_\_

## STABILIZER & SUPERSTRUCTURE PAINT

All six (6) stabilizers and the superstructure on the apparatus shall be painted job color. Single Coat application process shall be used to apply the color selected in this order using direct gloss paint on identified parts.

Y\_\_N\_\_

## TURNTABLE & BOOM PAINT

The turntable and the boom shall be painted job color black. Single Coat application process shall be used to apply the color selected in this order using direct gloss paint on identified parts.

Y\_\_N\_\_

## BOOM SUPPORT PAINT

The boom support shall be painted job color. Single Coat application process shall be used to apply the color selected in this order using direct gloss paint on identified parts.

Y\_\_N\_\_

## TORQUE BOX PAINT

The exterior and interior of the torque box shall be painted gloss black. Single Coat application process shall be used to apply the colors selected.

Y\_\_N\_\_

## HYDRAULIC TANK PAINT

The hydraulic tank shall be painted gloss black. Single Coat application process shall be used to apply the color selected in this order using direct gloss paint.

Y\_\_N\_\_

# Town of Westbrook 0300 Bid Specifications: Aerial Ladder Truck

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## CHEVRON STRIPING

The entire rear face of the body, including the rear compartment hinged door, shall be covered with 6" wide reflective striping in an alternating Scotchlite Red #680-72 and Scotchlite Yellow #680-71 chevron pattern with the stripes running at a 45 degree downward angle from the top center of the vehicle.

Y\_\_N\_\_

## LETTERING & STRIPING

Lettering and striping shall match, as closely as possible, existing Westbrook Fire Department apparatus.

Y\_\_N\_\_

# Town of Westbrook 0300 Bid Specifications: Aerial Ladder Truck

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## ELECTRONIC OPERATOR'S & PARTS MANUAL

A binder shall be supplied that has CDs and paper documents as listed below. The CD's shall have a linked Navigation page for easy access to information.

Navigation Page:

Instructions

Operation Manuals

Service & Maintenance

Electrical Systems

Parts

Certificates & Warranties

The binder shall contain 2 duplicate CDs. Each CD shall have:

1. Operations & maintenance instructions for all items on the vehicle, except the engine. The CD shall also include instructions for the transmission and the pump, if applicable.
2. Electrical diagrams including charts illustrating the individual wire color, number code, and function.
3. Parts manuals and an overall vehicle layout in 5 views shall be provided.
4. Certificates
5. Warranties

Printed documents shall include:

1. Operations & maintenance instructions for engine.
2. Certificates of independent test results.
3. Warranty documents.
4. Manufacturer's record of construction details and engine power curve.
5. Vehicle alignment report.

Additional CDs and paper documents, as provided by equipment suppliers, shall also be included.

Y\_\_N\_\_

Town of Westbrook - 0400 Form of General Bid:  
New Fire Department Aerial Ladder Truck

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SECTION 0400

FORM OF GENERAL BID

Proposal of \_\_\_\_\_ (hereinafter called "Bidder")\*

To the TOWN OF WESTBROOK, CONNECTICUT (hereinafter called "Town").

Gentlemen:

The Bidder, in compliance with your invitation for bids for the New Fire Department Aerial Ladder Truck, having examined the specifications with related documents, and being familiar with all of the conditions surrounding the furnishing of the proposed equipment including the availability of materials and labor, hereby proposes to furnish all labor, materials, and supplies, and to provide the equipment in accordance with the equipment specifications, as prepared by the Town, within the time set forth below, and at the prices stated below. These prices are to cover all expenses incurred in performing the work required under the contract documents, of which this proposal is a part.

The Bidder hereby agrees to commence work under this contract on or before a date to be fixed in the written "Notice to Proceed" given by the Owner to the Vendor and to fully complete all work related to the Contract within 30 calendar days of the execution of the Contract or the Notice to Proceed, whichever is later.

The Bidder agrees to provide the equipment and perform the work described in the specifications and shown on the plans for the following lump sum or unit prices:

[BIDDER: INSERT COMPLETE DESCRIPTION OF EQUIPMENT OR REFERENCE TO A SEPARATE BID SPECIFICATION]

**PRICE PROPOSAL**

ITEM	PRICE
EQUIPMENT	\$
INSTALLATION	\$
NET PRICE	\$

All entries shall be made clearly in ink or computer generated. Discrepancies between the indicated prices and the correct total will be resolved in favor of the correct total.

The above price shall include all labor, materials, bailing, shoring, removal, overhead, profit, insurance, etc., to cover the finished work called for.

Town of Westbrook - 0400 Form of General Bid:  
New Fire Department Aerial Ladder Truck

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The contract will be awarded to an eligible and responsible bidder.

The Bidder understands that the Owner reserves the right to reject any or all bids and to waive any informalities in the bidding.

The Bidder agrees that this bid shall be good and may not be withdrawn for a period of ninety (90) days, Saturdays, Sundays and legal holidays excluded, after the opening of bids.

The undersigned offers the following information as evidence of its qualifications to perform the work as bid upon according to all the requirements of the plans and specifications.

The undersigned certifies under penalties of perjury that this bid is in all respects bona fide, fair and made without collusion or fraud with any other person. As used in this paragraph the word "person" shall mean any natural person, joint venture, partnership, corporation or other business or legal entity.

Respectfully submitted:

Date \_\_\_\_\_

By \_\_\_\_\_  
(Signature)

\_\_\_\_\_  
(Name – Typed or Printed)

\_\_\_\_\_  
(Title)

(SEAL - if bid is by a corporation)

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

\_\_\_\_\_  
(Federal ID Number)

\_\_\_\_\_  
(Business Address)

\_\_\_\_\_  
(City and State)

\_\_\_\_\_  
(Telephone Number)