# TOWN OF WATERTOWN WATERTOWN, CONNECTICUT NOTICE OF BID Watertown Fire Department Fire Apparatus – 110' Rear Mount Aerial Ladder Truck

Sealed bids are invited and will be received by the Purchasing Agent of the Town of Watertown at the office of the Purchasing Agent, Town Hall, 61 Echo Lake Road, Watertown, Connecticut, until **11:00 a.m. Monday, March 27, 2023,** at which time and place they will be publicly opened and read aloud for furnishing one new 110" Rear Mount Aerial Ladder Truck to the Town of Watertown.

The Information for Bidders, Form of Bid, Specifications, Form of Bid Bond, Performance and Payment Bonds, and other contract documents may be obtained or examined at the office of the Purchasing Agent, Town Hall, 61 Echo Lake Road Watertown, Connecticut 06795 or by accessing the Town of Watertown's website at <u>http://www.watertownct.org.</u> Proposals must be submitted on the forms provided and in a sealed envelope plainly marked **"Bid – Watertown Fire Department Fire Apparatus"**.

To receive consideration bids must be in the hands of the Purchasing Agent or his authorized representative no later than the day and hour mentioned above.

The Purchasing Agent reserves the right to accept or reject any or all bids; to waive any informality; or to accept any bid deemed in the best interests of the Town of Watertown. The Town of Watertown reserves the right to take into account the residency of bidders within

the Town of Watertown and/or the location of the bidder's business within the Town of Watertown in awarding this bid.

All bids will be considered valid for a period of sixty (60) days.

Donna L. Ford Purchasing Agent Town of Watertown

# WATERTOWN, CONNECTICUT 06795

# Watertown Fire Department Fire Apparatus – 110' Rear Mount Aerial Ladder Truck

# BID OPENING: 11:00 a.m. Monday, March 27, 2023

# **PROPOSALS RECEIVED**

All bids must be in a sealed envelope and received prior to **11:00 a.m. Monday, March 27**, **2023,** at the office of the Purchasing Agent, 61 Echo Lake Road, Watertown, Connecticut 06795.

# **PREPARATION OF PROPOSALS**

Proposals must be made upon forms contained herein. The blank spaces in the Proposal must be filled in correctly where indicated. The Bidder must state the prices for which he proposes to do each item of the work contemplated. In case of discrepancy where both words and the numerals are requested, the words shall govern. Ditto marks are not considered writing or printing and shall not be used. The Bidder shall sign his Proposal correctly. If the Proposal is made by an individual, his name, post office address and telephone number must be shown. If made by a firm, partnership, or corporation, the Proposal must be signed by an official of the firm, partnership, or corporation authorized to sign contracts, and must show the post office address and telephone number of the firm, partnership, or corporation. Failure to do so may disqualify the bid.

Each bid must be submitted in a sealed envelope bearing on the outside the name of the Bidder, post office address, and name of the project for which the bid is submitted. If forwarded by mail, the sealed envelope containing the bid must be enclosed in another envelope addressed to: The Purchasing Agent, Town Hall, 61 Echo Lake Road, Watertown, CT 06795.

All information shall be entered in ink or by typewriter. Mistakes may be crossed out and corrections inserted before submission of your bid. The person signing the bid shall initial corrections in ink.

Corrections and/or modifications received after the closing time specified will not be accepted.

# SUBMISSION OF PROPOSALS

All proposals and literature shall be submitted **IN DUPLICATE** on the proposal form, which is a part of these specifications.

Descriptive literature containing complete specifications must accompany each bid. If a bidder wishes to furnish additional information, more sheets may be added.

Adobe Acrobat® Reader is required to view electronic documents on-line. If you do not have Adobe Acrobat® Reader, you may down load it for free from Adobe at http://www.adobe.com/products/acrobat/readstep.html.

Response summaries will be available online at <u>http://www.watertownct.org.</u> on the day of the bid opening.

Responses delivered via fax are received subject to the following qualifications and limitations:

- The Town is not responsible for the confidentiality of the information transmitted.
- The Town cannot guarantee that its fax equipment will be operational and able to receive transmittals by a particular time and date. It is the Bidder's responsibility to ensure that quotations are received in their entirety and on time at the required location. It is recommended that vendors be advised to call immediately after transmitting a document electronically to confirm complete and accurate receipt by the Town. The Town assumes no liability in the event that a bidder's electronic transmission is not received by the Town in a timely fashion, or is not received either in its entirety or error-free.
- Bids transmitted electronically which have a bond requirement are subject to the same submittal requirements as those responses delivered via traditional means, such as mail or hand delivery, or as otherwise stipulated by appropriate authority.

# **INCURRING COSTS**

The Town of Watertown is not liable for any cost incurred for the preparation of proposals or submission of samples by the firms submitting proposals for the work requested in this bid document or request for proposals.

# FAMILIARITY WITH THE WORK

Each bidder is considered to have examined the work to fully acquaint himself with the exact existing conditions relating to the work and has fully informed himself as to the work involved and the difficulties and restrictions attending the performance of this bid. Failure to do so will not relieve a bidder of his obligation to furnish the apparatus as described herein for the consideration set forth in this bid. The submission of a bid will be considered as conclusive evidence that the bidder has made such examination.

# **CONSIDERATION OF PRIOR SERVICE**

Previous performance, quality of service and merchandise will be considered.

# ADDENDA AND INTERPRETATIONS & ALTERNATE PROPOSALS

Addenda information will be available online at <u>http://www.watertownct.org.</u> Adobe Acrobat® Reader may be required to view this document. We strongly suggest that you check for any addenda a minimum of forty-eight hours in advance of the bid deadline.

At the time of the opening of bids each bidder will be presumed to have inspected the work and to have read and to be thoroughly familiar with all of the Contract Documents (including all addenda). The failure or omission of any bidder to receive or examine any form, instruction or document shall in no way relieve any bidder from any obligation in respect to his bid.

If any person contemplating submitting a proposal is in doubt as to the true meaning of any part of these specifications, he may submit a written request for an interpretation to the Purchasing Agent. No interpretations as to the meaning of the plans, specifications or other Contract Documents will be made to any bidder orally.

Every request for such interpretation should be in writing addressed (duplicate copy) to the Town of Watertown, Purchasing Agent, 61 Echo Lake Road, Watertown, Connecticut 06795, and to be given consideration, must be received at least five (5) days prior to the date fixed for the opening of Bids. Any and all such interpretations and any supplementary instructions will be in the form of written Addenda to the Specifications which, if issued, will be <u>mailed by Registered Mail with Return Receipt Requested</u> to all prospective bidders at the respective addresses furnished for

such purposes, not later than three (3) days prior to the date fixed for the opening of bids. Failure of any bidder to receive any such Addendum or interpretations shall not relieve any bidder from any obligations under his bid as submitted. All Addenda so issued shall become part of the Contract Documents. Oral explanations will not be binding on the Town.

The specifications listed are to be interpreted as meaning the minimum acceptable by the Town of Watertown. Bidders are requested to submit quotations on the basis of these specifications. Alternative bids providing a broader scope and/or services than requested in these specifications may receive consideration providing such equipment and/or service is clearly explained. Any exceptions to the specifications requested herein must be clearly noted in writing and are to be included as a part of your bid proposal. If none are included it will be assumed that there are none.

Definition of the word "complete" means that each unit of the equipment proposed shall include all appurtenances, fasteners, parts, accessories, and services ordinarily catalogued.

An item equal to that named or described in the specifications may be furnished by the Bidder, except where expressly noted as "no substitutions." The naming of any commercial name, trademark, or other identification shall not be construed to exclude any item of any manufacturer not mentioned by name, nor limit competition, but shall establish a standard of equality only. An item shall be considered equal to the item so named or described if:

- It is at least equal in quality, durability, appearance, strength and design.
- It will perform at least equally the function imposed by the design for the work being contracted for or the material being purchased.
- It conforms substantially, even with deviations, to the detailed requirements for the item in the specifications.

The Bidder shall hold the Town of Watertown, its officers, agents, servants, and employees, harmless from liability of any nature or kind because of use of any copyrighted or uncopyrighted compositions, secret process, patented or unpatented inventions, articles or appliances furnished or used under this bid, and agrees to defend, at his own expense, any and all actions brought against the Town of Watertown or himself because of the unauthorized use of such articles.

# **QUOTATION LIMITATION**

Bidders shall offer only **ONE ITEM AND PRICE** for each line item bid. If an or equal item is to be bid, the bidder is to select the brand and model that meets or exceeds the specified item, and submit his bid for that item.

# **SAMPLES**

Samples of articles, when required shall be furnished free of cost of any sort to the Town of Watertown. Samples received may be retained by the Town for future comparison. Samples which are not destroyed by testing, or which are not retained for future comparison will be returned upon request at the bidder's expense.

# WITHDRAWAL OF BID

Bidders may withdraw their proposals at any time prior to the bid date. No agent/broker shall withdraw or cancel their proposal for a period of sixty (60) days after the bid closing date of **11:00 a.m., Monday, March 27, 2023.** The successful agent/broker shall not withdraw, cancel or modify their proposal.

# **BID SECURITY**

Each bid must be accompanied by bid bond equal to five percent (5%) of the total bid for the first year of the proposal. Bid securities will be returned to all but the lowest three apparent low bidders at the time of the bid opening. The remaining bid securities will be returned upon signing of the contract. Bonds must be made to the order of the Town of Watertown in the form and with a surety company acceptable to the State Banking and Insurance Commissioner.

Securities may be held by the Town of Watertown for a period not to exceed 60 days from the date of the opening of the bids.

The successful bidder, upon his/her failure or refusal to sign the contract, shall forfeit to the Town as liquidated damages for such failure or refusal, an amount equal to the security deposited with his/her bid.

Bid security will be returned to all bidders except the successful bidder within five (5) calendar days after the bid award date. The date of the issuance of a Town of Watertown purchase order shall be considered the award. The bid security of the successful bidder will be returned upon receipt of the required performance bond, letter of irrevocable credit, other insurance, and any other items required by these bid specifications prior to commencing work or deliveries. If no award is made within sixty (60) days after the date of the bid opening, bid security will be returned to all bidders upon demand.

# **PERFORMANCE BONDS / PAYMENT BONDS**

A performance bond is required and shall be in the amount of 100% of the bid award, in the name of the "Town of Watertown", in the form and with a surety company approved by the State Commissioner of banking and insurance, and issued within ten (10) calendar days of the bid award date. Surety companies executing Bonds must appear on the Treasury Department's most current list (Circular 570 as amended) and be authorized to transact business in the State of Connecticut. This financial instrument shall be for the faithful performance of the contract, and shall be used at the sole discretion of the Town of Watertown to pay liquidated Damages for failure or refusal to perform in accordance with the contract. No withdrawals shall be made until after five (5) calendar days notice of noncompliance with the contract is sent by certified U.S. Mail. This in no way limits further actions the Town of Watertown may take.

# **POWER OF ATTORNEY**

Attorneys-in-fact who sign contract bonds must file, with each bond, a certified and effectively dated copy of their power of attorney.

# **EXECUTION OF CONTRACT**

The party to whom the Contract is awarded, or his authorized representative, will be required to attend at the office of the Purchasing Agent of the Town of Watertown, with the sureties offered by him or them, and a current certificate of Corporate good standing issued by the Office of the Secretary of State, in which the corporation is incorporated, and execute the Contract within five (5) days from the date of the award. If the party entering into this contract is a corporation, a Corporate Resolution duly executed by the President and Secretary of the Corporation to enter into this Contract shall be provided. In case of his failure or neglect so to do, the Town may, at its option, determine that the Bidder has abandoned the Contract, and thereupon the Proposal and acceptance shall be null and void, and bid security

accompanying the Proposal shall be forfeited as liquidated damages to the Town. If the party entering into this contract is a partnership, a partnership resolution duly executed by a majority of the general partners authorizing the partnership to enter into this contract shall be provided.

# **SUBCONTRACTORS**

Each bidder contemplating the use of any subcontractor shall submit a list of subcontractors as listed on the Bid Form.

The apparent low bidder shall file with the Town of Watertown, within five (5) days after the date of bid opening, a complete list of the names and addresses of competent, responsible and qualified subcontractors who are actually to perform major portions of the work. This in no way restricts or limits the requirement that all subcontractors must be approved by the Town.

Subcontractors listed on the Bid Form or those previously approved may not be changed without the approval of the Town of Watertown. Local subcontractors, material suppliers, and labor in the Town of Watertown should be considered and sought insofar, as is practical in the performance of this project.

# **QUALIFICATION OF BIDDER**

In determining the qualifications of a bidder, the Town may consider his record in the performance of any contracts for similar work into which he may have previously entered; and the Town expressly reserves the right to reject the bid of such bidder if such record discloses that such bidder, in the opinion of the Town, has not properly performed such contracts or has habitually, and without just cause, neglected the payment of bills or has otherwise disregarded his obligations to subcontractors, suppliers, state or local codes, men or employees of subcontractors.

The Town may make such investigation as he deems necessary to determine the ability of the bidder to perform the work and the bidder shall furnish to the Town all such information and data for this purpose as the Town may request. The Town reserves the right to reject any bid if the evidence submitted by or the investigation of such bidder fails to satisfy the Town that such bidder is properly qualified, or that such bidder misrepresented material facts in the bid documents.

# **DISQUALIFICATION OF BIDDERS**

More than one proposal from an individual, firm, partnership, corporation, or an association under the same or different names will not be considered. Reasonable grounds for believing that any Bidder is interested in more than one proposal for the work contemplated will cause the rejection of all proposals in which such Bidder is interested. Any or all proposals in which such Bidder is interested will be rejected if there is reason for believing that collusion exists among the Bidders and all participants in such collusion will not be considered in future proposals for the same work. Proposals in which the prices are obviously unbalanced may be rejected. No Contract will be awarded except to competent Bidders capable of performing the class of work contemplated.

# SERVICE CENTER REQUIREMENTS

To insure the Town of a source for service and parts over the anticipated 30 year life of the apparatus, the apparatus manufacturer shall maintain a factory service, fabrication/manufacturing, painting and testing facility within an acceptable distance from the

Town of Watertown and shall indicate in his bid the name and location of the factory service facility which complies with the above stated requirement.

# **DELIVERY**

Inasmuch as this work concerns a needed public improvement, the provisions of this bid relating to the time of delivery, performance and completion of the work are of the essence of this bid. Accordingly, the successful bidder shall commence work **upon receipt of the signed Purchase Order** unless the Town shall authorize or direct a further delay, and shall proceed with the work diligently so as to permit completion no later than **July**, **2025**, **or 740 calendar days after receipt of the Town's Purchase Order**.

Time of delivery shall be stated as the number of calendar days following receipt of the Purchase Order by the Bidder to receipt of the goods or services by the Town of Watertown.

Prices quoted must include delivery to the Town of Watertown as specified on the Purchase Order. No charges will be allowed for parking, crating, freight, express or cartage unless specifically stated and included in this bid.

Time of delivery may be considered in the award.

# PAYMENT

The successful bidder shall execute three (3) copies of the contract agreements. The Town of Watertown encourages Bidders to propose payment options including but not limited to progress payments, prepayments or any payment option that would provide financial benefits to the Town.

The Town, after inspection and acceptance of workmanship, and in consideration of the faithful performance by the Bidder of all and singular his covenants, promises, and agreements contained herein, agrees to pay the Bidder for the full completion by him of the work embraced in this Contract, upon written acceptance by the Watertown Fire Department, within (10) Ten Days of the receipt of the final invoice. When subcontractors or suppliers are utilized, the successful contractor for this project shall be required to submit a Mechanics Lien Waiver, acceptable to the Town, with each progress payment, and/or at time of final payment, prior to any payment made.

Time, in connection with any discount offered, will be computed from the date of delivery to the Town or from the date a correct invoice is received by the Town's Finance Department, if the latter date is later than the date of delivery.

Prices will be considered as **NET**, if no cash or payment discount is shown.

The successful bidder shall submit invoices to the following address:

Town of Watertown Watertown Fire Department 935 Main Street Watertown CT 06795

# IT IS UNDERSTOOD AND AGREED THAT SHOULD A BID BE ACCEPTED, IT WILL AUTOMATICALLY BECOME THE CONTRACT OR AN ADDENDUM TO ANY CONTRACT AGREED UPON.

Notification of the bid award will be made by issuance of a purchase order. Bidders are to list their bids on the appropriate attached sheets. Bidders may attach a letter of explanation. A clear

notification should be made on the standard bid sheets at the appropriate point of explanation that there is a letter of explanation attached. All bids must be NET prices.

The successful bidder shall submit an itemized invoice to the Town of Watertown for the work as described herein.

The bidder shall be required to submit a Mechanics Lien Waiver, acceptable to the Town of Watertown, with each progress payment and at time of final payment prior to any payment being made.

At the time of award the successful bidder shall be required to supply the Town of Watertown a Certificate of Good Standing, certifying that the corporation is in fact a valid corporation and presently licensed to conduct business in the State of Connecticut.

# SALES TAX

Certain materials and supplies incorporated in the work of this project are exempt from Connecticut Sales Tax. The Bidder shall familiarize himself with current regulations of the State Tax Department. The tax on materials or supplies exempted by such regulations shall not be included as part of the bid. The Town will furnish the successful Bidder sales tax exemption authorization.

# COMPLIANCE WITH FEDERAL, STATE AND LOCAL CODES

The Bidder shall be responsible for full compliance with any Federal, State and/or Local codes, laws, regulations and standards, as applicable<del>.</del>

# AWARD

The Town of Watertown reserves the right to accept or reject any bid to best serve its interests, or to hold the bids for sixty (60) days before decision.

When analyzing the bid proposals, and in recommending a successful bidder, superior design, workmanship, materials, operating costs, location of factory, past experience, length of incorporation, compliance with specifications, price and completion time will be taken into consideration.

The Town reserves the right to reject any and all bids (or any part thereof), to waive defects in proposals, or to accept any proposal deemed to be in its best interest.

Exceptions will be considered to the specification provided, providing they are listed and fully explained on a separate page entitled "EXCEPTIONS TO SPECIFICATIONS"

Each exception will be considered as to its degree of impact and total effect on the bid. The purchaser shall determine which (if any taken) exceptions are acceptable, and this determination shall be final.

The Town of Watertown reserves the right:

- To award bids received on the basis of individual items, or groups of items, or on the entire list of items.
- To reject any or all bids, or any part thereof.
- To waive any informality in the bids. The Town of Watertown reserves the right to take into account the residency of bidders within the Town of Watertown and/or the location of the bidders business within the Town of Watertown in awarding this bid.
- To accept the bid that is in the best interest of the Town of Watertown. The Purchasing Agent's decision shall be final

# **INSURANCE**

A. General:

The Bidder shall be responsible for maintaining insurance coverage in force for the life of the contract of the kinds and adequate amounts to secure all of the Bidder's obligations under the contract with an insurance company with an AM Best Rating of A - VII or better licensed to write such insurance in Connecticut and acceptable to the Town of Watertown.

The insurer shall provide the Town of Watertown with Certificates of Insurance signed by an authorized representative of the insurance company(ies) prior to the performance of this contract describing the coverage and providing that the insurer shall give the Town of Watertown written notice at least thirty (30) days in advance of any termination, expiration, or any and all change in coverage.

Such insurance or renewals or replacements thereof shall remain in force during the Bidder's responsibility under this agreement.

The Bidder at his own cost and expense shall procure and maintain all insurance required and shall name the Town of Watertown as an additional insured on all contracts except Worker's Compensation and Professional Errors & Omissions coverage.

In order to facilitate this requirement for insurance, it is recommended that the bidder forward a copy of this exhibit to the bidder's insurance representative(s).

- B. Specific Requirements:
- (1) <u>Workers' Compensation Insurance</u>
  - The Bidder shall provide Workers' Compensation Insurance required by law and the Employer's Liability Insurance for at least the amounts of liability for Bodily Injury by accident of \$100,000 each accident; Bodily Injury by Disease each employee of \$100,000; Bodily Injury by Disease, policy limit of \$500,000.
- (2) <u>Commercial General Liability Insurance</u> The Bidder shall carry Commercial General Liability policy (Insurance Services Office Incorporated Form CG-0001 or equivalent). A per occurrence limit of \$1,000,000 is required. The Aggregate Limit will be not less than \$1,000,000.
- (3) <u>Business Automobile Liability Insurance</u>

The Bidder shall carry Business Automobile Liability Insurance. (Insurance Services Office Incorporated Form CA-00001 or equivalent). A per occurrence limit of \$1,000,000 is required. "Any Auto" (symbol 1 or equivalent) is required.

C. Hold Harmless & Subcontractor's Requirements:

The Bidder shall require the same insurance that it is required to carry by the Town of Watertown to be carried by any subcontractors and independent contractors hired by the Bidder and to obtain Certificates of Insurance before subcontractors and independent contractors are permitted to begin work.

The Bidder shall require that the Town of Watertown be named as Additional Insured on all subcontractor's and independent contractor's policies before they are permitted to begin work.

The Bidder and all subcontractors and independent contractors and their insurers shall waive all rights of subrogation against the Town of Watertown, and its officers, agents, servants and employees for losses arising from the work performed by each on this contract.

The Bidder assumes and agrees to hold harmless, indemnify, protect and defend the Town of Watertown against any and all liability for injuries and damages to Bidder and to Bidder's

employees, agents, subcontractors and guests, third parties or otherwise incident to or resulting from any and all operations performed by a contractor under any terms of this contract.

- D. Other Data:
- NOTE 1: If Bidder is only a vender shipping goods via Common Carrier only, General Liability is required.
- NOTE 2: If Bidder is a Professional, Errors & Omission coverage will be required.
- NOTE 3: The Town reserves the right to amend amounts of coverage required and the types of coverage provided based on work or service to be performed.

# NONDISCRIMINATION IN EMPLOYMENT

The successful bidder shall agree and warrant that, in the performance of this contract, he will not discriminate or permit discrimination against any person or group of persons on the grounds of race, color, sex, religion, or national origin in any manner prohibited by State, Federal, County, or Municipal law. A certification of Nonsegregated Facilities and a Certification Regarding Equal Employment Opportunity shall be considered a part of this contract.

# **MECHANICS LIEN WAIVERS**

The successful Bidder shall be required to submit a Mechanics Lien Waiver, acceptable to the Town of Watertown, with each progress payment, and/or at time of final payment, prior to any payment made.

For further technical or administrative information contact Donna L. Ford, Purchasing Agent at (860) 945-5260 or via email at ford@watertownct.org.

# PLEASE

IT IS A REQUIREMENT OF THIS BID THAT EACH PROPOSAL SUBMITTED MUST HAVE A DUPLICATE COPY ATTACHED.

YOUR COOPERATION IS APPRECIATED

## **SPECIFICATIONS**

## **INTENT OF SPECIFICATIONS**

It shall be the intent of these specifications to provide a complete apparatus equipped as hereinafter specified. With a view to obtaining the best results and the most acceptable apparatus for service in the Department, these specifications cover only the 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 and construction for all features. The National Fire Protection Association Standard 1901, 2016 edition, unless otherwise specified in these specifications, shall prevail.

Bids shall only be considered from companies that have an established reputation in the field of fire apparatus construction and have been in continuous business for a minimum of thirty-five (35) years. A written chronological history of the bidder shall be included in the bid response package.

Each bidder shall furnish satisfactory evidence of their ability to construct the apparatus specified, and shall state the location of the factory where the apparatus is to be built. They shall also show that they are in a position to render prompt service and to furnish replacement parts for said apparatus.

Because of the severe service requirements, the department will impose on this apparatus, each bidder shall provide a reference list of at least eight (8) departments in which similar apparatus utilizing the brand of chassis proposed have been in service for over one (1) year. This list shall include contact names and phone numbers. To properly evaluate the builder's performance, at least one (1) of these departments shall serve populations of over 200,000, and the apparatus in this department shall been in service over seven (7) years. This reference list shall be included in the bidder's response package.

No experimental, prototype or recently introduced products without a verifiable, minimum four (4) year service record on the combination of the chassis and fire equipment proposed will be acceptable. For bid evaluation purposes, this information, including photographs and drawings of units previously constructed, shall be included in the bid response package.

Each bid shall be accompanied by a set of "Contractor's Specifications" consisting of a detailed description of the apparatus being furnished under this contract which conform. Computer runoff sheets are not acceptable as "Contractor's Specifications". Note: Each bidder shall submit their bid in the same sequence as these specifications to allow the department to easily compare bid. There shall be no exception to this requirement.

These specifications shall indicate size, type, model and make of all component parts and equipment.

#### **QUALITY AND WORKMANSHIP:**

The design of the Apparatus must embody the latest approved automotive engineering practices.

The workmanship must be of the highest quality in its respective field. Special consideration will be given to the following points: Accessibility of the various units that require periodic maintenance operations, ease of operation (including both Aerial and driving) and symmetrical proportions.

Construction shall be rugged and ample safety factors shall be provided to carry loads as specified and to meet both on and off-road requirements and to speed conditions as set forth under "Performance tests and requirements".

Welding shall be employed in the assembly of the apparatus in a manner that will not prevent the ready removal of any component part for service or repair.

## **DELIVERY:**

Apparatus, to insure proper break-in of all components while still under warranty, shall be delivered under its own power. A qualified delivery engineer representing the contractor shall instruct the Fire Department Personnel in the proper operation, care and maintenance of the equipment delivered.

#### HIGHWAY PERFORMANCE

With the apparatus loaded to its estimated in-service weight, the front to rear weight distribution shall be within limits set by the chassis manufacturer. The apparatus shall comply with all GAWR and GVWR ratings of the chassis.

While loaded to its estimated in-service weights, the apparatus shall be capable of the following performance while on dry paved roads that are in good condition:

1. The apparatus shall be capable of accelerating from 0 to 35 MPH from a standing start within 25 seconds on a 0 % grade.

2. Attaining a speed of 50 MPH on a 0 % grade.

3. Maintaining a speed of at least 20 MPH on any grade up to and including 6 %.

## LIABILITY:

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

#### **GENERAL CONSTRUCTION:**

The apparatus shall be designed with due consideration to distribution of load between the front and rear axles, so that all specified equipment, including filled water tank, a full complement of personnel and fire hose will be carried without injury to the apparatus. Weight balance and distribution shall be in accordance with the recommendations of NFPA #1901.

The apparatus shall be designed so that all recommended daily maintenance checks can be performed easily by the operator, without the need for hand tools. Apparatus components that interfere with repair or removal of other major components must be attached with fasteners (cap, screws, nuts, etc.) so that the components can be removed and installed with normal hand tools. These components must not be welded or otherwise permanently secured into place.

The GAWR and GVWR of the chassis shall be adequate to carry the fully equipped apparatus including all tanks filled, the specified hose load, unequipped personnel weight, ground ladders and a miscellaneous equipment allowance of 2000 lbs. It shall be the responsibility of the purchaser to provide the contractor with the weight of equipment to be carried if it is in excess of the allowance of 2,000 lbs.

The unequipped personnel weight shall be calculated at 200 lbs. per person, times the maximum number of persons to ride on the apparatus.

The height of the fully loaded vehicle's center of gravity shall not exceed the chassis manufacturer's maximum limit.

The front to rear weight distribution of the fully loaded vehicle shall be within the limits set by the chassis manufacturer. The front axle loads shall not be less than the minimum axle loads specified by the chassis manufacturer, under full loads and all other loading conditions.

The difference in weight on the end of each axle, from side to side, when the vehicle is fully loaded and equipped shall not exceed 7 percent.

The apparatus shall be so designed that the various parts are readily accessible for lubrication, inspection, adjustment and repair.

Where special tools manufactured or designed by the contractor and are required to provide routine service on any component of the apparatus built or supplied by the contractor, such tools shall be provided with the apparatus.

## EXCEPTIONS OR CLARIFICATIONS TO SPECIFICATIONS

These specifications have been carefully prepared by the Department, taking into consideration, among other items, performance of our previous apparatus. In order to provide a unit that we know will give outstanding performance in our particular operating environment, the following Chassis, Aerial and Body specifications shall be strictly adhered to. Exceptions or Clarifications shall be allowed if they are judged by the department to be equal to or superior to those items specified, and will be given careful consideration provided they are listed and fully explained on a separate page entitled "Exceptions or Clarifications to Specifications". This list must refer to our specification page number and paragraph. Proposals taking total exception to specifications or total exception to certain parts of the specifications such as Electrical Systems, Body or Aerial, will not be accepted. Apparatus shall be inspected upon delivery for compliance with specifications. Deviations will not be tolerated and will be cause for rejection of Apparatus unless they were originally listed in bidder's proposal and accepted in writing by the department.

If the bidder takes an exception, on the exception page, the bidder must state an option price to bring their specifications into full compliance with the Department specifications. Failure to provide this information shall be cause to reject the proposal as being non-responsive.

#### PURCHASER'S RIGHTS

The Purchaser reserves the right to accept or reject any or all bids as it deems to be of their best interest to do so.

## CHASSIS STORAGE

The chassis, on which this apparatus will be constructed, shall not be stored where it will be exposed to the sun, rain, snow, hail or other elements. The chassis shall be stored in an enclosed, protected environment until construction is begun. For evaluation purposes, photographs and a detailed description of the chassis storage provisions shall be included in the bid response package. There shall be no exception to these protected chassis storage provisions.

#### APPROVAL DRAWINGS

After award of the bid, the contractor shall provide detailed, "D" size engineering drawings for use at the preconstruction conference. These drawings shall include, but not limited to, the overall dimensions, wheelbase, and overall length of the proposed apparatus shall be required with the bid. The drawing shall include right, left, top and rear views of the apparatus. These drawings shall be updated and sent back to the department if any changes are made at the pre-construction conference.

For evaluation purposes, samples of the as-built electrical system schematics, engineered plumbing drawings and layout approval drawings, shall be included in the bid proposal package.

# PRODUCT LIABILITY INSURANCE

To adequately protect the Department, and its members, the manufacturer shall provide a minimum of \$10,000,000.00 of liability insurance. A copy of the insurance certificate shall be included in the bidder's response package.

#### DELIVERY

The unit shall be delivered under its own power, by a factory-trained representative. Bids that do not include delivery to the purchaser shall not be acceptable. The unit will remain insured by the apparatus manufacturer until the department accepts the unit.

#### AERIAL & APPARATUS TRAINING

The successful bidder shall provide a minimum eight (8) hour structured training course for personnel assigned to operate the apparatus, covering nomenclature of components, proper operation of the apparatus, daily operational maintenance checks, and other information necessary for a firefighter/driver/engineer to properly operate and maintain the apparatus.

It is intended that this training be organized in such a manner that both the mechanics and fire personnel receive full benefit of the aforementioned structured training. The firefighter/operator training shall be conducted within one week after the vehicle is fully accepted and readied for service by the "Purchaser" or at a time mutually agreed upon by the "Purchaser" and "Supplier".

#### **INFORMATION FOR CONTRACTORS**

Sealed proposals are desired from reputable manufacturers of Automotive Fire/Rescue Apparatus in accordance with these attached specifications for the apparatus as briefly described below:

#### GENERAL REQUIREMENTS

Each bid <u>must be</u> accompanied by bidders accurate written and detailed specifications covering the apparatus and related items which the bidder is proposing to furnish and to which the apparatus furnished under contract must conform. It is the intent of these specifications to cover the furnishing to the purchaser a complete apparatus constructed and equipped exactly as specified in the attached specifications. Any details of construction, materials, or equipment not specified are left to the discretion of the Contractor, whom will be responsible for all construction and manufacturing techniques involved in the assembly of the apparatus.

All aspects of the apparatus shall conform to any applicable rules/regulations imposed to such vehicles by any of the following Governing Agencies:

- National Fire Protection Association (not including recommended equipment).
- Occupational Safety Health Administration.
- Federal Motor Vehicle Safety Standards.
- Department of Transportation.
- Underwriter's Laboratories.

#### **RELIABILITY OF CONTRACTOR/BIDDER**

The contractor/bidder shall furnish evidence that he has the ability to design, engineer and construct the apparatus specified and shall clearly state the location of the facility used to manufacture and test the equipment when completed. Manufacturer must have a minimum of a twenty-year track record in the manufacturing of fire/rescue apparatus.

The contractor/bidder shall be capable of performing all of the following items at their manufacturing facility. Under no circumstance shall any of these items be sub-contracted to other manufacturers or fabricators:

- 1. Complete fabrication of the apparatus body and components.
- 3. All 12 volt and 110-volt electrical wiring.
- 4. All painting and finish work.

Any contractor/bidder that does not perform all of the above items shall be rendered un-responsive and their bid proposal shall be eliminated from the bid evaluation procedure causing rejection of bid.

The contractor/bidder shall provide a list of a minimum of 5 similar apparatus constructed within the last two years. The name and contact person, along with telephone number, shall be provided with this. Also, a list of a minimum of 5 apparatus that have been constructed over ten years ago shall also be provided. The name and contact person, along with telephone number shall be provided.

#### EXCEPTIONS TO SPECIFICATIONS

It is the intent of the Purchaser to purchase a fire/rescue apparatus that has a proven record of dependability and reliability in the fire/rescue service. <u>Experimental manufacturing techniques or materials are not acceptable and will be immediately rejected</u>. Exceptions to the attached specifications will be considered provided they are of equal or superior quality and/or value of what has been specified. All bidders shall provide supporting documentation with proposal that may prove the 'equal to' or 'superior' quality or value. The Purchaser shall be solely responsible for determining 'equal to' or 'superior' status. The Purchaser's decision regarding these items will be final and conclusive.

Any area(s) of the attached specification that contain statements such as 'no exceptions' or similar statements with the same general meaning shall be strictly adhered to. The Purchaser has deemed these items to be extremely important to achieve the final delivered product that the Purchaser wishes to purchase. Any exceptions to these areas will result in immediate rejection of that bidder's proposal regardless of bid price.

All exceptions, no matter how minor, or seemingly un-important, must be detailed fully with supporting documentation submitted with proposal. Failure to submit exceptions and supporting documentation will cause immediate rejection of bidder's proposal.

All bidders shall be aware that the attached specifications shall be made part of the Purchase Contract between the Purchaser and the contractor/bidder. The successful bidder will be required to meet all construction, fabrication, and material requirements as called for in these specifications. Any deviations from these specifications must be specifically listed, explained, and submitted with the bid proposal. Failure to submit the detailed exceptions will indicate to the Purchaser that an exception is not taken and the bidder will provide the construction, fabrication, and material requirements as desired by the Purchaser and detailed in the attached specifications. Submission of list of exceptions does not indicate acceptance/approval of exceptions by the Purchaser.

In the unlikely event that the contractor/bidder fails to construct the apparatus as requested in the attached specifications, the Purchaser retains the right to reject the entire apparatus and invoice the contractor/bidder for any costs or losses that the Purchaser may have incurred due to the contractor/bidder failing to meet specifications described in the purchase contract.

#### "BRAND NAME" CLAUSE

It is the intent of the Purchaser to purchase components that have a proven record of Fire Department use and satisfaction. All bidders should be aware that were brand names are listed in these specifications, comparable products from different manufacturers may be acceptable. The bidder shall simply provide the Department with a listing of brands that they intend to provide in lieu of the originally requested brand.

The Fire Department will evaluate the proposed brand name to determine if the brand is equal to or superior to the originally requested brand.

#### **CONTRACTOR'S SPECIFICATIONS**

All contractor's or bidders shall submit a detailed specification as to how the apparatus being proposed will be constructed. The attached specifications, copies, or re-typed versions of these specifications shall not be submitted as contractors' specifications, (this will not pertain to the contractor whose specifications these are based on). Any manufacturer doing so will be rejected immediately on the following grounds:

"Contractor/bidder did not provide sufficient supporting data describing the contractors/bidders manufacturing and fabrication processes implemented in the construction of the proposed apparatus versus what was requested in the Purchaser's original specifications."

The contractors/bidder's specification shall describe, in detail, all manufacturing and fabrication processes as well as material used in the construction of the apparatus. Other items that must be clearly listed in the contractors/bidder's specifications shall include all compartment and door dimensions, cubic feet of usable storage space per compartment, and all other items specifically called for in the attached specifications.

# CORPORATE OWNERSHIP OF MANUFACTURER

The manufacturer of the apparatus must be fully owned and managed by a Parent Company, Corporation, or Individual(s) that is 100% held by United States of America based Company, Corporation, or United States citizen(s).

Proposals from any manufacturer that is fully or partially owned and/or operated by a foreign company, Corporation or Individual(s) under any type of ownership, partnership, or any similar type of agreement will be immediately rejected.

# CORPORATE CONTACT INFORMATION

The purchaser shall be provided with the following information to allow them to contact the President/CEO of the manufacturing company (not dealer) when deemed necessary:

- Name of Company President.
- Office address.
- Office telephone number.
- Email address.
- Home address.
- Home telephone number.
- 24/7 Cellular telephone number.

If the manufacturing company is a subsidiary of, division of, or owned by a different Company, the above information shall also be provided on the 'Parent' Company.

There will be no exception to this requirement.

#### AWARD OF CONTRACT

The bid shall be awarded to the contractor or bidder that most closely meets all requirements set forth in the attached specifications. All contractor's or bidders shall be aware that exceptions taken will not affect the award of bid provided that all exceptions are determined to be 'equal to' or 'superior to' the attached specifications. The Purchaser shall be solely responsible to determine this.

The purchase contract shall list the manufacturer of the apparatus as the Contractor and shall not include a sales representative or company as the Contractor unless these are one in the same. The purchase contract shall be presented to the Purchaser within 15 days of notification of bid award to the contractor/bidder.

All contractor's or bidders shall be aware that it is not the intention of the Purchaser to award the contract to the apparent low bidder. The Purchaser reserves the right to reject any or all bids and to accept the bid that the Purchaser feels is in the best interest of the Purchaser both now and in the future.

#### **RIGHT TO NEGOTIATE**

All bidders shall be aware that this request for bid shall allow the Fire Department to negotiate with any bidder on items such as price, content and general apparatus design after opening of bids. This will allow the Department to

adjust the apparatus design and content as deemed necessary to remain within budget restraints that may be present or for any other reason or purpose.

All bidders shall be aware the Department is not required to purchase "low bid" and reserves the right to purchase an apparatus that the Department chooses to purchase with no other recourse afforded to other bidders.

#### 24/7 FACTORY SUPPORT

The manufacturer (not dealer) of the apparatus shall maintain a 24 hours per day, 7 days per week, and 365 days per year factory support contact system to allow the purchaser to contact the manufacturer in case of emergency. The system shall be activated by a telephone call to the manufacturing facility.

#### **DELIVERY OF COMPLETED APPARATUS**

When the apparatus is completed at the manufacturer's facility, a factory trained delivery technician shall deliver the apparatus to the Purchaser. The technician shall familiarize all individuals designated by the purchaser on the operation and maintenance of the apparatus at this time. The technician shall remain at the purchaser's location for a sufficient period of time to allow all individuals to gain a thorough knowledge of the operation of the apparatus.

# PRE-CONSTRUCTION CONFERENCE

The bidder shall provide a pre-construction conference at the factory in which the apparatus will be constructed. An engineer of the manufacturing company shall be available to answer and design and/or technical questions. A sales representative of the manufacturer must also be present but will not be sufficient representation for the engineer. All travel expenses incurred by the purchaser for up to four (4) officials shall be paid by the contractor. Air fare and overnight expenses shall be included if the factory is more than 450 miles from the purchaser's location. The bidder shall indicate in their proposal that this conference will be provided.

## PRE-DELIVERY FINAL INSPECTION

The contractor shall provide a pre-delivery final inspection at the factory in which the apparatus will be constructed. All travel expenses incurred by the purchaser for up to four (4) officials shall be paid by the contractor. Air fare and overnight expenses shall be included. The bidder shall indicate in their proposal that this inspection will be provided.

#### WEB BASED CUSTOMER INTERACTION

The manufacturer shall provide web-based access to construction photographs while the apparatus is being built. This access shall be provided through a secured area on the manufacturer's website and shall be accessible only by individuals authorized by the Department.

The following photos, at minimum, shall be available:

- 1. Chassis (front, left, right and rear).
- 2. Body prior to pre-paint (front, left, right and rear).
- 3. Body painted (front, left, right and rear).
- 5. Pump module, if applicable, (front, left, right and rear).
- 6. Final assembly (front, right, left and rear).

This web-based interaction will enhance the communication process during the construction of the apparatus and will provide the Department remote access to the apparatus during construction process.

Due to the complexity of apparatus, this interaction will provide the Department a method of checking specification compliance. Because this interaction is considered critical to the construction process, no exception will be allowed to this requirement.

# **BLUEPRINT DRAWING(S) - Two (2)**

All bidders must submit with their proposal Two (2) blueprint drawing(s) of the exact apparatus being proposed. Drawing(s) of similar units <u>will not</u> be acceptable. Blueprint(s) must be submitted on minimum "D" size, paper to allow for an accurate, easy to read, visual interpretation of the apparatus proposed by the manufacturer.

The drawing(s) shall show the complete left side view of the apparatus, including the chassis as well as right side and rear body views showing all compartment dimensions, door opening sizes, compartment depths, and total cubic feet of usable compartment space per compartment.

Any proposal received without the required drawing(s) will be immediately rejected.

## **BID GUARANTY**

All bids shall be accompanied by a Surety or Bid Bond in the amount of 10 percent of the bid amount made payable to the purchaser and provided by the manufacturer of the apparatus. (Bonds submitted by dealers or agents will not be acceptable.) Failure to submit this bond, or submission by a dealer or agent in lieu of the manufacturer, will result in immediate rejection of said bid proposal.

# PERFORMANCE AND PAYMENT GUARANTY

The successful bidder to whom the award is made shall execute and deliver to the purchaser a Performance and Payment bond on the amount of 100 percent of the contract price amount. The Bond shall be made payable to the purchaser and shall be provided by the manufacturer of the apparatus. (Bonds submitted by dealers or agents will not be acceptable.) Failure to submit this bond within 21 days of official notification of bid award will result in rejection of said bid proposal.

#### **BID VALIDITY PERIOD**

In order to allow sufficient time to allow the purchaser, or designated officials thereof, sufficient time to evaluate all bid proposals received, all bids must remain valid for a period not less than 30 calendar days from date of bid opening. All prices must remain firm for the entire period.

During the evaluation period, bidders may be asked to further clarify their proposals or answer questions that may arise during the evaluation of bid. It is the responsibility of the bidder to make clarifications, **<u>in writing</u>**, on the fire apparatus manufacturer's letterhead and signed by the President and/or General Manager of the manufacturing company. These written clarifications must be received within 72 hours of when they were requested by the purchaser. Failure to respond within the allowed time period will deem the bid proposal unresponsive and it will be rejected.

All information that is requested in the original bid packet must be included in the sealed bid proposal. Bidders will not be allowed to submit required documents after opening of bids. Failure to include required information with bid will result in rejection of bid proposal.

#### \*\*\* LENGTH REQUIREMENT \*\*\*

#### The maximum length of this apparatus shall not exceed 41' (492'').

#### **CERTIFICATION OF NFPA 1901-2016 COMPLIANCE**

As per NFPA 1901, the Purchaser shall assume the responsibility of determining, prior to the purchase of the apparatus, who will be responsible for ensuring that all aspects of NFPA 1901 are met. The manufacturer shall be responsible for providing or performing only the items requested by the purchaser in the documents provided to the manufacturer by the purchaser.

Written certification shall be provided by the manufacturer stating that the delivered apparatus complies with the NFPA 1901 Standard. If the purchaser has elected to provide, perform, outsource and/or contract with a third party or waive any item required by NFPA 1901, the manufacturer shall provide, upon delivery, a "Statement of Exceptions" per Chapter 4 of NFPA 1901 4.21.

The "Statement of Exceptions" shall include:

- A separate specification of the section of the NFPA Standard for which the apparatus is lacking compliance.
- A description of the particular aspect of the apparatus that is not compliant therewith or required equipment that is missing.
- A description of the further changes or modifications to the delivered apparatus which must be completed to achieve full compliance.
- An identification of the entity that will be responsible for making the necessary post-delivery changes or modifications or for supplying and installing any missing required equipment to the apparatus to achieve full compliance to the standard.

Prior to, or at the time of, delivery of the apparatus, the Statement of Exceptions shall be signed by an authorized agent of the entity responsible for the final assembly of the apparatus and by an authorized agent of the purchasing entity, indicating a mutual understanding and agreement between the parties regarding the substance thereof.

The purchaser shall not place the apparatus into active emergency service until fully compliant with NFPA 1901.

## NFPA REQUIRED EQUIPMENT

The end user of this apparatus shall provide all other equipment and accessories that are required by NFPA 1901 but not specifically listed in these specifications.

#### MAXIMUM TOP SPEED

The maximum top speed of this apparatus shall be determined using the following NFPA 1901 Chapter 4 criteria:

- Apparatus with 1250 gallon combined water tank capacity shall not exceed 60 MPH.
- Apparatus with GVWR of over 50,000 lbs. shall not exceed 60 MPH.
- Apparatus weighing over 26,000 lbs. shall not exceed 68 MPH.

#### FIRE HELMET MOUNTING

The end user of the apparatus shall be responsible for insuring that all helmets are either stored in an exterior compartment or a securely mounted to NFPA 1901 standards inside the cab.

#### WEIGHT CERTIFICATION

Documents from a certified scale showing actual loading on the front, rear and overall apparatus shall be provided. The apparatus shall be scaled without personnel, equipment and hose.

## **UNDERWRITER'S LABORATORIES TESTING**

The apparatus shall undergo an Underwriter's Laboratories Aerial Certification Test to ensure that the completed apparatus meets the requirements of NFPA 1901. The certificate shall be provided to the purchaser upon completion. Underwriter's Laboratories shall also perform the required testing on the entire installed electrical system. Self-certification by the apparatus manufacturer will not be acceptable.

## MANUFACTURER'S RECORD OF APPARATUS CONSTRUCTION

All information required to comply with NFPA 1901 4.20.1 shall be provided with the completed apparatus.

#### **OPERATIONS AND SERVICE DOCUMENTATION**

The apparatus shall be complete with all operation and service documentation covering the apparatus as delivered and accepted. The documentation shall address the inspection, service and operations of the apparatus and all major components as required in NFPA 1901 4.20.2.

#### TIRE PRESSURE VISUAL INDICATORS - TANDEM AXLE

Real Wheels RWTG1234 valve stem mounted visual indicators shall be provided on each tire. The LED indicators shall flash when the tire pressure drops 8 psi.

#### SCBA SEAT DANGER LABEL - FAMA11

If the apparatus is equipped with SCBA seats in the cab, a permanent label shall be provided inside of the cab warning of the dangers of using the seat without the SCBA properly secured or seat insert in place. The label shall warn of potential injury or death that could be caused by improper use of the seat.

#### CAB TILT AERIAL INTERLOCK

A limit switch shall be installed on the aerial boom support to prohibit cab tilt unless the aerial is raised from the ladder travel support.

#### **LED PERIMETER GROUND LIGHTING - seven (7)**

There shall be seven (7) LED perimeter ground lights furnished and installed on the apparatus body. The lights shall have an unbreakable polycarbonate lens and housing. The lights shall be sealed to help prevent moisture entry.

The ground lights shall be activated with the parking brake, and also a virtual switch in the Vista Display. NOTE: Chassis ground lighting is listed in the chassis section of this specification.

#### LED APPARATUS BODY STEP LIGHTING

All apparatus steps and running boards shall be illuminated using chrome plated or stainless-steel LED lights. The lights shall function automatically with the park brake.

#### **GROUND/STEP LIGHTING CUTOFF SWITCH**

A ground/step light cut off switch shall be provided in the cab to allow the driver to disable the ground lights and other lights that activate when the parking brake is set. The switch shall automatically re-set itself when the parking brake is released.

#### ENGINE HORIZONTAL EXHAUST

Shielding shall be provided between the apparatus body and the exhaust pipe if necessary to deflect heat away from the body. The exhaust system shall be designed and installed to comply with EPA equipment requirements and shall not be modified.

#### HOT EXHAUST DANGERS LABEL - FAMA04

A permanent label shall be provided near any hot exhaust surface that warns of potential injury or death that could be caused by contact with the surface. The label shall also state precautions that should be taken while working on or around the surface.

# REAR MUD FLAPS

Heavy duty black rubber mud flaps shall be provided on the rear wheels. The mud flaps shall be attached to the apparatus in the rear wheel well area using heavy-duty stainless-steel retention straps that are secured into place using stainless steel fasteners.

#### TRAINED OPERATOR ONLY LABEL - FAMA25

A permanent label shall be provided on the aerial control panel that states that only properly trained personnel should operate the apparatus and shall indicate that injury or death could occur as a result.

#### HYDRAULIC HIGH-PRESSURE LEAKS WARNING LABEL - FAMA29

If the apparatus is equipped with any component(s) that are powered by high hydraulic pressure, a permanent label shall be provided near the majority of all hydraulic lines and components.

The label shall warn of potential injury or death that could occur when working on or around any hydraulic component or hose and provide basic safety precautions that should be taken when doing so.

#### **STABILIZER CRUSH WARNING LABEL - FAMA30**

A permanent label shall be provided near each stabilizer and at the stabilizer control area warning of potential injury or death that could be caused by the stabilizer. The label shall also indicate safety precautions that should be taken while operating or working around the stabilizer.

## **STABILIZER PINS AND PADS WARNING LABEL - FAMA31**

A permanent label shall be provided at the stabilizer control area warning of potential injury or death that could be caused by the improper use of or failing to use stabilizer pins and pads as well as safety precautions that should be taken when deploying the stabilizers.

#### **STABILIZER PADS WARNING LABEL - FAMA32**

A permanent label shall be provided at the stabilizer control area warning of potential injury or death that could be caused by the improper use of or failing to use stabilizer pads as well as safety precautions that should be taken when deploying the stabilizers.

#### **STABILIZERS NOT EXTENDED WARNING LABEL - FAMA33**

A permanent label shall be provided adjacent to the 'stabilizer not extended' warning light stating that the stabilizers are not fully extended.

## FALL RESTRAINT/SAFETY HARNESS WARNING LABEL - FAMA34

A permanent label shall be provided at the base as well as the ladder tip warning of potential injury or death that could be caused by not using a safety harness and restraint belt not properly attached to the device.

#### **AERIAL ELECTROCUTION WARNING LABEL - FAMA35**

A permanent label shall be provided at the base at the aerial control location(s) and pump panel (if apparatus is

equipped with a pump) warning of potential injury or death that could be caused by coming into or operating in the area, of power lines and related equipment. The label shall also state safety precautions that should be taken while operating around power lines.

# **AERIAL ELECTROCUTION WARNING LABEL - FAMA36**

A permanent label shall be provided on both sides and rear of the apparatus warning of potential injury or death that could be caused by coming into or operating in the area, of power lines and related equipment. The label shall also state safety precautions that should be taken while operating around power lines.

#### AERIAL DEVICE LOAD CAPACITY WARNING LABEL - FAMA37

A permanent label shall be provided at the turn table, in the platform (if applicable) and at tip control (if applicable) warning of potential injury of death that could be caused by exceeding rated load capacity of the device. The label shall also state safety precautions relating to wind, ice and surface stability.

#### **AERIAL LADDER RUNG PINCH WARNING LABEL - FAMA38**

A permanent label shall be provided at any aerial control location warning of potential injury or death that could be caused by movement of the ladder rungs. The label shall also state safety precautions relating hand and feet placement on the rungs.

#### **AERIAL INSPECTION LABEL - FAMA39**

A permanent label shall be provided at the turn table control location warning of potential injury or death that could be caused by failing to follow the instruction manual and inspection/maintenance schedules.

#### FALL PROTECTION ANCHOR LABEL - FAMA40

A permanent label shall be provided adjacent to any fall protection anchor. The label shall serve as a reminder to properly connect to the anchor.

#### AERIAL DEVICE OPERATOR ATTENTION LABEL - FAMA47

A permanent label shall be provided at the turn table control panel and tip controls/platform (if applicable) on the pump panel that states that only properly trained personnel should operate the apparatus as well as notice to discontinue use and remove personnel from device in dangerous conditions. The label shall also warn of potential injury or death if proper rules are not followed.

#### **BATTERY DANGERS LABEL - FAMA01**

A permanent label shall be provided near the battery location that warns of potential injury or death that could be caused by the batteries. The label shall also state precautions that should be taken while working on or around the batteries.

#### **ROTATING SHAFTS DANGER LABEL - FAMA02**

A permanent label shall be provided on each side of the frame rail and in any other location(s) where rotating shaft hazards are apparent. The label shall warn of potential injury or death that could be caused by the movement of the shaft(s) as well as precautions that should be taken while working on or around them.

#### HOT SURFACE DANGERS LABEL - FAMA03

A permanent label shall be provided near any hot surface that warns of potential injury or death that could be caused by contact with the surface. The label shall also state precautions that should be taken while working on or around the surface.

## SPINNING ENGINE FAN DANGER LABEL - FAMA05

A permanent label shall be provided on both sides of the engine fan. The label shall warn of potential injury or death that could be caused by the movement of the fan as well as precautions that should be taken while working on or around them.

## SEATED AND BELTED WARNING LABEL - FAMA07

A permanent label shall be provided that is visible to all occupants that states that they should be seated and belted while the apparatus is in motion. The label shall also state potential injuries or death that could be caused if the safety belts are not used properly.

## AIR CONDITIONING REFRIGERANT WARNING LABEL - FAMA09

If the apparatus is equipped with any type of air conditioning system, a permanent label shall be provided that is located in an area that would be visible to service personnel. The label shall state that the system contains R134A, the necessary precautions that should be taken and the dangers of working on or around the system.

## **CAB INTERIOR EQUIPMENT MOUNTING DANGER LABEL - FAMA10**

A permanent label shall be provided inside of the cab warning of the dangers of unsecured equipment inside the cab. The label shall state that all equipment shall be properly secured and also warn of potential injury or death that could be caused by failing to do so.

## FIRE SERVICE TIRE RATING LABEL - FAMA12

A permanent label shall be provided inside of the cab in view of the driver while entering the cab warning of the dangers of improper use of the tires on the apparatus. The label shall also warn of potential injury or death that could be caused by improper tire use or condition.

#### **ELECTRONIC STABILITY CONTROL LABEL - FAMA13**

If the apparatus is equipped with an electronic stability control system, a permanent label shall be provided inside of the cab in view of the driver warning of the dangers of improper operation of the apparatus and the importance of safe driving. The label shall also warn of potential injury or death that could be caused by improper operation of the apparatus.

#### **MAXIMUM OCCUPANCY LABEL - FAMA14**

A permanent label shall be provided inside of the cab in view of the driver stating the maximum number of personnel that can ride in the apparatus. The label shall also warn of potential injury or death that could be caused by exceeding the stated capacity.

#### **DO NOT WEAR HELMET LABEL - FAMA15**

A permanent label shall be provided inside of the cab in view of all seated positions stating that helmets should not be worn in cab. The label shall also warn of potential injury or death that could be caused by wearing helmet in cab.

#### VEHICLE BACKING LABEL - FAMA17

A permanent label shall be provided inside of the cab in view of the driver advising of proper procedures to following when the apparatus is in reverse motion. The label shall also warn of potential injury or death that be caused by failing to follow proper procedures.

## ACCESS STEPS/LADDER LABEL - FAMA23

A permanent label shall be provided at any area of the apparatus where personnel will be boarding or exiting the apparatus. The label shall instruct the operator in the proper method of climbing into or onto the apparatus as well as exiting and provide indication of potential injury or death that could occur in failing to do so.

#### TRAINED OPERATOR ONLY LABEL - FAMA25

A permanent label shall be provided on the operator's panel that states that only properly trained personnel should operate the apparatus and shall indicate that injury or death could occur as a result.

#### **NOT A STEP WARNING LABEL - FAMA26**

A permanent label shall be provided in any horizontal location that a firefighter may feel tempted to use as a step but is not designed, constructed or intended to be a stepping, standing or walking surface. The label shall state that the surface is not intended for this purpose and indicate potential injury or death in doing so.

#### CAB TILT WARNING LABEL - FAMA41

A permanent label shall be provided inside the driver's door warning of potential injury or death that could be received in the area under or around a tilted cab. The label shall also state safety precautions that should be taken when the cab is tilted.

#### FLUID CAPACITY LABEL

A permanent plate shall be mounted in the driver's compartment specifying the quantity and type of the following fluids used in the apparatus (if applicable) for normal maintenance:

- Engine oil.
- Engine coolant.
- Chassis transmission fluid.
- Pump transmission fluid.
- Pump primer fluid.
- Drive axle fluid.
- Air conditioning refrigerant.
- Air conditioning lubrication oil.
- Power steering fluid.
- Cab-tilt mechanism fluid (if applicable).
- Transfer case fluid (if applicable).
- Equipment rack fluid (if applicable).
- CAFS compressor system lubricant (if applicable).
- Generator system lubricant (if applicable).
- Front tire cold pressure.
- Rear tire cold pressure.
- Maximum tire speed ratings.

#### LENGTH, HEIGHT, WEIGHT LABEL

A permanent plate or label shall be provided in the cab stating the overall length, height and the gross vehicle weight rating (GVWR), in tons, of the completed apparatus.

The wording on this label shall indicate that the information on the plate/label was current at the time of manufacture and if the overall height of the apparatus changes while the vehicle is in service, the purchaser shall revise the height dimension on the plate.

# VEHICLE ROLLOVER STABILITY

The apparatus chassis shall be equipped with a stability control system and shall be certified to NFPA 1901 Rollover Stability requirements.

#### **CHASSIS SPECIFICATION**

#### MODEL

The chassis shall be a Gladiator model. The cab and chassis shall include design considerations for multiple emergency vehicle applications, rapid transit and maneuverability. The chassis shall be manufactured for heavy duty service with the strength and capacity to support a fully laden apparatus, one hundred (100) percent of the time.

#### MODEL YEAR

The chassis shall have a vehicle identification number that reflects a 2024 model year.

#### **COUNTRY OF SERVICE**

The chassis shall be put in service in the country of United States of America (USA).

The chassis will meet applicable U.S.A. federal motor vehicle safety standards per CFR Title 49 Chapter V Part 571 as clarified in the incomplete vehicle book per CFR Title 49 Chapter V Part 568 Section 4 which accompanies each chassis. The chassis manufacturer is not responsible for compliance to state, regional, or local regulations. Dealers should identify those regulations and order any necessary optional equipment from the chassis manufacturer or their OEM needed to be in compliance with those regulations.

#### CAB AND CHASSIS LABELING LANGUAGE

The cab and chassis shall include the applicable caution, warning, and safety notice labels with text to be written in English. All applicable caution, warning, and safety notice labels shall be Innovative Controls brand. Where applicable to the location within the specific layout and label package of the cab and chassis, the labels shall include decorative chrome bezels. Designs shall include bezels that fit individual labels or packaged configurations of labels in certain common locations.

The following labels shall be Innovative Controls brand, each including a decorative chrome bezel (where applicable):

- Shoreline
- Aerial Stowed
- Aerial Breakers 2
- Air Conditioner
- Cab Tilt Plate
- Air Compressor Breaker
- Battery Conditioner Breaker
- Helmet Caution
- Horn Tag
- Q2B Tag
- Load Center Plate
- Not a Step Label
- Occupancy Tag
- Do Not Move
- Occupants Must Be Seated
- Do Not Stand
- Danger Do Not Weld

- Danger--Untrained Operator
- DEF Fill Access (Including Additional 2907 Optional Labels)
- Battery Direct
- Kneeling
- IFS Air Fault
- Engine Brake
- Retarder
- LR 100 Amp Node
- 300 Amp EPU
- 100 Amp Front O/R Node
- 100 Amp T/T Node
- 100 Amp RR O/R Node
- 10 Amp EPU
- Master Power
- 12 Volt Power
- Aerial Hours
- Pump In Drive
- Windshield Washer Fluid

#### APPARATUS TYPE

The apparatus shall be an aerial vehicle designed for emergency service use. The apparatus shall be equipped with a ladder, elevating platform or water tower that shall be rear mounted thus providing the following vehicle benefits:

- Improved mobility vs. mid-ship mounted units, due to shorter overall travel length and wheelbase.
- Increased compartment space, hose load, and water capacity in the body, resulting from ladder being raised to clear the cab.
- Shorter vehicle wheelbase.
- Shorter overall length of vehicle.

#### **REAR MOUNT AERIAL DEVICE TYPE**

Chassis provisions shall be provided for a 110.00 feet high vertical reach rear mount ladder to the integration parameters of Ladder Tower Company.

#### AERIAL HYDRAULIC GENERATOR

Chassis shall include aerial provisions for a chassis PTO driven hydraulic pump piggy-backed for aerial device hydraulics and 120VAC hydraulic generator.

#### VEHICLE TYPE

The chassis shall be manufactured for use as a straight truck type vehicle and designed for the installation of a permanently mounted apparatus behind the cab. The apparatus of the vehicle shall be supplied and installed by the apparatus manufacturer.

## VEHICLE ANGLE OF APPROACH PACKAGE

The angle of approach of the apparatus shall be a minimum of 8.00 degrees.

#### NFPA1901 Angle of Approach definition:

"To determine the angle of approach, place a thin steel strip against the front of the tires where they touch the ground or stretch a tight string from one front tire to the other at the front where they touch the ground. Determine the lowest point (component or equipment) on the vehicle forward of the front tire that would make the smallest angle of approach. Hang a plumb bob from the lowest point and mark the point on the ground where the point of the plumb bob touches. Measure the vertical distance from the ground to the point where the plumb bob was hung (distance V). Measure the horizontal distance from the plumb bob point to the steel strip or string running from front tire to front tire (distance H). Divide the vertical distance by the horizontal distance. The ratio of V/H is the tangent of the angle of approach. If the ratio is known, the angle of approach can be determined from a table of trigonometric functions of angles or from a math calculator. The standard requires a minimum angle of approach of 8.00 degrees is 0.1405, if V divided by H is 0.1405 or larger, the angle of approach is 8.00 degrees or greater."

#### **AXLE CONFIGURATION**

The chassis shall feature a 6 x 4 axle configuration consisting of a tandem rear drive axle set with a single front steer axle.

#### **GROSS AXLE WEIGHT RATINGS FRONT**

The front gross axle weight rating (GAWR) of the chassis shall be 23,000 pounds.

This front gross axle weight rating shall be adequate to carry the weight of the completed apparatus including all equipment and personnel.

#### GROSS AXLE WEIGHT RATINGS REAR

The rear gross axle weight rating (GAWR) of the chassis shall be 52,000 pounds.

This rear gross axle weight rating shall be adequate to carry the weight of the completed apparatus including all equipment and personnel.

#### CAB STYLE

The cab shall be a custom, fully enclosed, LFD model with a flat roof over the driver, officer, and crew area, designed and built specifically for use as an emergency response vehicle by a company specializing in cab and chassis design for all emergency response applications. The cab shall be designed for heavy-duty service utilizing superior strength and capacity for the application of protecting the occupants of the vehicle. This style of cab shall offer up to ten (10) seating positions.

The cab shall incorporate a fully enclosed design with side wall roof supports, allowing for a spacious cab area with no partition between the front and rear sections of the cab. To provide a superior finish by reducing welds that fatigue cab metal; the roof, the rear wall and side wall panels shall be assembled using a combination of welds and proven industrial adhesives designed specifically for aluminum fabrication for construction.

The cab shall be constructed using multiple aluminum extrusions in conjunction with aluminum plate, which shall provide proven strength and the truest, flattest body surfaces ensuring less expensive paint repairs if needed. All aluminum welding shall be completed to the American Welding Society and ANSI D1.2-96 requirements for structural welding of aluminum.

All interior and exterior seams shall be sealed for optimum noise reduction and to provide the most favorable efficiency for heating and cooling retention.

The cab shall be constructed of 5052-H32 corrosion resistant aluminum plate. The cab shall incorporate tongue and groove fitted 6061-T6 0.13 & 0.19-inch-thick aluminum extrusions for extreme duty situations. A single formed, one (1) piece extrusion shall be used for the "A" pillar, adding strength and rigidity to the cab as well as additional roll-over protection. The cab side walls and roof skin shall be 0.13-inch-thick; the rear wall skin shall be 0.09-inch-thick; the front cab structure shall be 0.19 inch thick.

The exterior width of the cab shall be 99.40 inches wide with a minimum interior width of 91.00 inches. The overall cab length shall be 144.60 inches with 67.50 inches from the centerline of the front of the axle to the back of the cab.

The cab interior shall be designed to afford the maximum usable interior space and attention to ergonomics with hip and legroom while seated which exceeds industry standards. The crew cab floor shall be flat across the entire walking area for ease of movement inside the cab.

The cab shall offer an interior height of 57.50 inches from the front floor to the headliner and a rear floor to headliner height of 55.00 inches at a minimum. The cab shall offer an interior measurement at the floor level from the rear of the engine tunnel to the rear wall of the cab of 63.38 inches. All interior measurements shall include the area within the interior trimmed surfaces and not to any unfinished surface.

The cab shall include a driver and officer area with two (2) cab doors large enough for personnel in full firefighting gear. The front doors shall offer a clear opening of 40.25 inches wide X 53.50 inches high, from the cab floor to the top of the door opening. The cab shall also include a crew area with up to two (2) cab doors, also large enough for personnel in full firefighting gear. The rear doors shall offer a clear opening of 32.25 inches wide X 51.00 inches high, from the cab floor to the top of the door opening.

The cab shall incorporate a progressive two (2) step configuration from the ground to the cab floor at each door opening. The progressive steps are vertically staggered and extend the full width of each step well allowing personnel in full firefighting gear to enter and exit the cab easily and safely.

The first step for the driver and officer area shall measure approximately 11.50 inches deep X 31.13 inches wide. The intermediate step shall measure approximately 8.50 inches deep X 32.50 inches wide. The height from the first step to the intermediate step and the intermediate step to the cab floor shall not exceed 11.00 inches.

The first step for the crew area shall measure approximately 11.50 inches deep X 20.44 inches wide. The intermediate step shall measure approximately 10.25 inches deep X 22.75 inches wide. The height from the first step to the intermediate step and the intermediate step to the cab floor shall not exceed 12.80 inches.

#### **OCCUPANT PROTECTION**

An IMMI 4Front® occupant protection system shall be installed in the vehicle's cab. The system shall inflate three (3) air bags in the following locations:

- Steering wheel air bag to protect the head and neck of the driver
- Knee bolster air bag to protect the driver's legs
- Knee bolster air bag to protect the officer's legs

The air bags shall use a combination of high-pressure stored argon and oxygen with a pyrotechnic charge for initiation to inflate the bags remain inflated for several seconds.

The system shall be connected to the crash detection sensor that will also activate the driver and first officer integrated belt pretensioners if it detects a frontal crash.

A RollTek<sup>™</sup> rollover occupant protection system shall be installed in the apparatus cab. The system shall include an integrated roll sensor (IRS) master module and a slave sensor in applicable configurations.

The IRS shall be a microprocessor-controlled solid-state sensing device that utilizes vehicle-specific calibrations to detect rollovers. The IRS shall be equipped with pyrotechnic loops for connection to the protective countermeasures which shall include seat integrated side roll airbags (SRA), integrated seat belt pretensioners, and air seat pull-downs (S4S), in applicable occupant seat positions.

The IRS shall continuously monitor the truck's acceleration and angle, and upon detection of an imminent roll-over, shall activate protective countermeasures in a pre-programmed sequence. In addition, the IRS shall also act as a data recorder to record crash events for post-crash evaluation.

#### CAB FRONT FASCIA

The front cab fascia shall be constructed of 5052-H32 Marine Grade, 0.13 of an inch-thick aluminum plate which shall be an integral part of the cab.

The cab fascia will encompass the entire front of the aluminum cab structure from the bottom of the windshield to the bottom of the cab and shall be the "Classic" design.

The front cab fascia shall include two (2) molded plastic modules on each side accommodating a total of up to four (4) Hi/Low beam headlights and two (2) turn signal lights or up to four (4) warning lights. A chrome plated molded plastic bezel shall be provided on each side around each set of four lamps.

## FRONT GRILLE

The front cab fascia shall include a classic box style, 304 stainless steel front grille. The grille shall measure 55.45 wide X 33.50 inches high X 1.50 inches deep. The upper portion of the grille shall be hinged to provide service access behind the grille. The grille shall include a minimum free air intake of 750.00 square inches.

#### CAB UNDERCOAT

There shall be a rubberized undercoating applied to the underside of the cab that provides abrasion protection, sound deadening and corrosion protection.

#### CAB SIDE DRIP RAIL

There shall be a drip rail along the top radius of each cab side. The drip rails shall help prevent water from the cab roof running down the cab side.

#### **CAB PAINT EXTERIOR**

The cab exterior shall be painted two tone per customers specified paint colors.

#### CAB PAINT PROCESS/MANUFACTURER

The cab shall be painted with PPG Industries paint prior to the installation of glass accessories and all other cab trim to ensure complete paint coverage and the maximum in corrosion protection of all metal surfaces.

All metal surfaces on the cab shall be mechanically etched by sanding disc to remove any surface oxidation or surface debris which may hinder the paint adhesion. Once all imperfections on the exterior surfaces are removed and sanded smooth, body fillers shall be applied to the cab on all surfaces that require a critically aesthetic finish and sanded smooth.

The entire cab shall then be coated with a high-quality base primer that is designed to fill any minor surface defects, provide an adhesive bond between the primer and the paint and improve the color and gloss retention of the color. The finish to this procedure shall be sanding the cab to a smooth finish followed by sealing the seams with an automotive seam sealer. The minimum thickness of the primer coat after sanding shall be 2.50 mils with a maximum thickness of 5.00 mils.

The cab shall then be painted the specific color(s) designated by the customer with an acrylic urethane type system designed to retain color and resist acid rain and most atmospheric chemicals found on an emergency scene. The paint shall have a minimum thickness of 1.00 mils with a maximum of 4 mills, followed by a clear top coat with a minimum of 2.5 mils and a maximum of 3.5 mils. The entire cab shall then be baked to speed the curing process of the coatings.

# CAB PAINT PRIMARY/LOWER COLOR

The lower paint color shall be PPG FBCH 72704 ALT red.

#### CAB PAINT SECONDARY/UPPER COLOR

The secondary/upper paint color shall be PPG FBCH 2185 white.

#### CAB PAINT EXTERIOR BREAKLINE

The upper and lower paint shall meet at a breakline on the cab which shall be located approximately 1.00 inch below the door windows on each side of the cab. The breakline shall curve down at the front cab corners to approximately 5.00 inches below the windshields on the front of the cab.

#### CAB PAINT PINSTRIPE

Where the upper and lower paint colors meet a temporary 0.50-inch-wide black pinstripe shall be applied over this break line to offer a more finished look prior to the final pinstripe being installed by the OEM.

## **CAB EXTERIOR ROLL-UP DOOR FINISH**

The roll-up doors on the exterior of the cab shall have a two-tone painted finish the same as the primary and secondary colors of the cab. The trim along the side of the door shall be painted to match the door. The painting of the primary color shall be provided by the roll-up door manufacturer and the painting of the upper color shall be provided by the chassis manufacturer. The painting shall be complete prior to the doors being installed into the compartment.

#### CAB PAINT WARRANTY

Purchaser shall receive a Paint and Finish (Exterior Clear coated) Ten (10) Years limited warranty in accordance with, and subject to, warranty certificate RFW0710. The warranty certificate is incorporated by reference into this proposal, and included with this proposal or available upon request.

#### **CAB PAINT INTERIOR**

The visible interior cab structure surfaces shall be painted with a multi-tone silver gray texture finish.

#### CAB ENTRY DOORS

The cab shall include four (4) entry doors, two (2) front doors and two (2) crew doors designed for ease of entering and egress when outfitted with an SCBA. The doors shall be constructed of extruded aluminum with a nominal thickness of 0.13 inch. The exterior skins shall be constructed of 0.13-inch aluminum plate.

The doors shall include a double rolled style automotive rubber seal around the perimeter of each door frame and door edge which ensures a weather tight fit.

All door hinges shall be hidden within flush mounted cab doors for a pleasing smooth appearance and perfect fit along each side of the cab. Each door hinge shall be piano style with a 0.38-inch pin and shall be constructed of stainless steel.

## CAB ENTRY DOOR TYPE

All cab entry doors shall be barrier clear design resulting in exposed lower cab steps. The doors shall provide approximately 32.00 inches of clearance from the ground to the bottom of the door so cab doors may be opened unhindered by most obstacles encountered, such as guard rails along interstate highways.

Entry doors shall include Pollak mechanical plunger style switches for electrical component activation.

## **CAB INSULATION**

The cab ceiling and walls shall include nonwoven polyester fiber insulation. The insulation shall act as a barrier absorbing noise as well as assisting in sustaining the desired climate within the cab interior.

# LH MID EMS COMPARTMENT

The cab shall include a compartment located in the middle of the wall above the left side wheel well. This compartment shall measure 17.00 inches wide X 43.00 inches high X 23.00 inches deep.

#### LH MID EMS EXTERIOR ACCESS

The cab shall include an Amdor roll up door located in the middle of the wall above the left side wheel well. The compartment shall have a clear door opening of 14.50 inches wide X 34.00 inches high. There shall be a switch to activate the open compartment warning light in the cab in the event the door is left ajar.

#### LH MID EMS COMPARTMENT INTERIOR

The cab compartment located in the middle of the wall above the left side wheel well shall include solid aluminum walls with an interior access point rear facing. This compartment shall be finished to customer specification.

#### LH MID EMS COMPARTMENT INTERIOR ACCESS

The left-hand EMS compartment shall include access from inside the cab. The compartment shall be accessible from the inside of the cab via an aluminum framed aluminum hinged door with one (1) non-locking latch. The interior access door shall feature a clear door opening of 14.50 inches wide and as tall as possible in the available customer specified left EMS compartment height and access point. The interior access door shall include a finish to match the EMS compartment exterior finish.

#### LH MID EMS COMPARTMENT INTERIOR SHELVING

The left-hand mid EMS compartment located in crew area of the cab shall include one (1) aluminum shelf which shall be secured using Unistrut channel on two (2) sides of the interior walls of the compartment. The shelf shall include a 1.00-inch lip around the edges. The shelf shall be finished the same as the interior of the compartment.

#### LH MID EMS COMPARTMENT TRIM

The cab shall include a polished stainless-steel scuff plate wrapped around the bottom edge of the compartment opening. The scuff plate shall extend approximately .50 inches onto the painted surface below the left side compartment door.

## RH MID EMS COMPARTMENT

The cab shall include a compartment located in the middle of the wall above the right side wheel well. This compartment shall measure 17.00 inches wide X 43.00 inches high X 23.00 inches deep.

#### **RH MID EMS EXTERIOR ACCESS**

The cab shall include an Amdor roll up door located in the middle of the wall above the right side wheel well. The compartment shall have a clear door opening of 14.50 inches wide X 34.00 inches high. There shall be a switch to activate the open compartment warning light in the cab in the event the door is left ajar.

#### **RH MID EMS COMPARTMENT INTERIOR**

The cab compartment located in the middle of the wall above the right side wheel well shall include solid aluminum walls with an interior access point rear facing. This compartment shall be finished to customer specification.

#### RH MID EMS COMPARTMENT INTERIOR ACCESS

The right hand EMS compartment shall include access from inside the cab. The compartment shall be accessible from the inside of the cab via an aluminum framed aluminum hinged door with one (1) non-locking latch. The interior access door shall feature a clear door opening of 14.50 inches wide and as tall as possible in the available customer specified right EMS compartment height and access point. The interior access door shall include a finish to match the EMS compartment exterior finish.

#### RH MID EMS COMPARTMENT INTERIOR SHELVING

The right hand mid EMS compartment located in crew area of the cab shall include one (1) aluminum shelf which shall be secured using Unistrut channel on two (2) sides of the interior walls of the compartment. The shelf shall include a 1.00-inch lip around the edges. The shelf shall be finished the same as the interior of the compartment.

#### RH MID EMS COMPARTMENT TRIM

The cab shall include a polished stainless-steel scuff plate wrapped around the bottom edge of the compartment opening. The scuff plate shall extend approximately .50 inches onto the painted surface below the right side compartment door.

#### MID EMS COMPARTMENT LIGHTING

The interior portion of each of the mid EMS compartments shall include compartment door activated LED lighting to illuminate all usable surfaces within each compartment.

#### **MID EMS COMPARTMENT EXTERIOR FINISH**

The mid EMS compartment surfaces that are exposed to the interior of the cab shall be painted with a multi-tone silver gray texture finish.

#### MID EMS COMPARTMENT INTERIOR FINISH

The interior of the mid EMS compartment shall be painted with a multi-tone silver gray texture finish.

# LH EXTERIOR REAR COMPARTMENT

The cab shall offer an exterior compartment on the left side of the cab behind the rear door. The compartment opening shall be 10.00 inches wide X 21.19 inches high. The compartment size shall be 11.34 inches wide X 21.19 inches high X 21.19 inches deep. The compartment shall have a 10.63-inch-wide, 32.00-inch-high and 1.50-inch-thick hinged box pan style flush mount door with a bright aluminum tread plate inner panel and a bent D-ring slam latch. There shall be a switch to activate a light inside the compartment and the open compartment warning light in the cab in the event the door is left ajar.

## LEFT HAND EXTERIOR REAR COMPARTMENT LIGHTING

There shall be one (1) Amdor Luma-Bar<sup>™</sup> LED strip light installed to illuminate the exterior rear compartment on the left side of the cab. The strip light shall be approximately 11.00 inches long.

## LH EXTERIOR COMPARTMENT INTERIOR FINISH

The interior of the left hand exterior compartment shall have a multi-tone silver gray texture finish.

## **RH EXTERIOR REAR COMPARTMENT**

The cab shall offer an exterior compartment on the right side of the cab behind the rear door. The compartment opening shall be 10.00 inches wide X 21.19 inches high. The compartment size shall be 11.34 inches wide X 21.19 inches high X 21.19 inches deep. The compartment shall have a 10.63-inch-wide, 32.00-inch-high and 1.50-inch-thick hinged box pan style flush mount door with a bright aluminum tread plate inner panel and a bent D-ring slam latch. There shall be a switch to activate a light inside the compartment and the open compartment warning light in the cab in the event the door is left ajar.

#### **RIGHT HAND EXTERIOR REAR COMPARTMENT LIGHTING**

There shall be one (1) Amdor Luma-Bar<sup>™</sup> LED strip light installed to illuminate the exterior rear compartment on the right side of the cab. The strip light shall be approximately 11.00 inches long.

#### **RH EXTERIOR COMPARTMENT INTERIOR FINISH**

The interior of the right hand exterior compartment shall have a multi-tone silver gray texture finish.

#### CAB STRUCTURAL WARRANTY

Purchaser shall receive a Cab Structure (Aluminum) Ten (10) Years or 100,000 Miles limited warranty in accordance with, and subject to, warranty certificate RFW0602. The warranty certificate is incorporated by reference into this proposal, and included with this proposal or available upon request.

#### CAB TEST INFORMATION

The cab shall have successfully completed the preload side impact, static roof load application and frontal impact without encroachment to the occupant survival space when tested in accordance with Section 4 of SAE J2420 <u>COE</u> <u>Frontal Strength Evaluation Dynamic Loading Heavy Trucks</u>, Section 5 of SAE J2422 <u>Cab Roof Strength</u> <u>Evaluation Quasi</u> –Static Loading Heavy Trucks and ECE R29 <u>Uniform Provisions Concerning the Approval of</u> <u>Vehicles with regard to the Protection of the Occupants of the Cab of a Commercial Vehicles</u> Annex 3 Paragraph 5.

The above tests have been witnessed by and attested to by an independent third party. The test results were recorded using cameras, high speed imagers, accelerometers and strain gauges. Documentation of the testing shall be provided upon request.

## ELECTRICAL SYSTEM

The chassis shall include a single starting electrical system which shall include a 12-volt direct current multiplexing system, suppressed per SAE J551. The wiring shall be appropriate gauge cross link with 311-degree Fahrenheit insulation. All SAE wires in the chassis shall be color coded and shall include the circuit number and function where possible. The wiring shall be protected by 275-degree Fahrenheit minimum high temperature flame retardant loom. All nodes and sealed Deutsch connectors shall be waterproof.

## OEM WIRING

A custom wiring interface and harness shall be provided and designed to meet the requirements provided by the apparatus manufacturer. This shall include the following circuits/features:

- Remote engine start circuit shall be provided to activate the engine starter solenoid from the aerial apparatus and shall utilize existing cab starter interlocks. The input for starter activation shall be provided and programmed by the apparatus manufacturer through the Weldon V-mux system.
- Remote engine stop circuit shall be provided to shut down the chassis engine from the aerial apparatus. The input for chassis engine shutdown shall be provided and programmed by the apparatus manufacturer through the Weldon V-mux system.
- Additional master power circuit located at apparatus manufacturer chassis interface connector at least 12 gauge in size and capable of supplying 20 amps.
- Additional communication connection for Weldon V-Mux multiplex system shall be provided and located near the apparatus manufacturer chassis interface connector.
- Aerial PTO override SPST guarded toggle switch located in the driver's diagnostic panel and labeled "Aerial PTO Override". When activated, the switch will override standard PTO interlocks and supply direct power to the aerial PTO solenoid for emergency activation.

The custom chassis harness shall also include additional inputs/outputs for Neutral, Park Brake, PTO Request, PTO Enable (input), and PTO Enable (output).

#### APPARATUS WIRING PROVISION

An apparatus wiring panel shall be installed in the center dash area behind the rocker switch panel which shall include eight (8) open circuits consisting of three (3) 20 amp, one (1) 30 amp, three (3) 10 amp, and one (1) 15-amp circuit, with relays and breakers with trigger wires which shall be routed to the rocker switch panel.

#### MULTIPLEX DISPLAY

The multiplex electrical system shall include (2) Weldon Vista IV displays which shall be located one (1) on the right side of the dash in the switch panel and one (1) on the left side of the dash in the switch panel. The Vista IV displays shall feature full color LCD display screens which include a message bar displaying the time of day and important messages requiring acknowledgement by the user which shall all be displayed on the top of the screen in the order they are received. There shall be eight (8) push button virtual controls, four (4) on each side of the display for the on-board diagnostics. The display screens shall be video ready for back-up cameras, thermal cameras, and DVD.

The Vista IV displays shall offer varying fonts and background colors. The displays shall be fully programmable to the needs of the customer and shall offer virtually infinite flexibility for screen configuration options.
# LOAD MANAGEMENT SYSTEM

The apparatus load management shall be performed by the included multiplex system. The multiplex system shall also feature the priority of sequences and shall shed electrical loads based on the priority list specifically programmed.

# DATA RECORDING SYSTEM

The chassis shall have a Weldon Vehicle Data Recorder (VDR) system installed. The system shall be designed to meet NFPA 1901 and shall be integrated with the Weldon Multiplex electrical system. The following information shall be recorded:

- Vehicle Speed
- Acceleration
- Deceleration
- Engine Speed
- Engine Throttle Position
- ABS Event
- Seat Occupied Status
- Seat Belt Status
- Master Optical Warning Device Switch Position
- Time
- Date

Each portion of the data shall be recorded at the specified intervals and stored for the specified length of time to meet NFPA 1901 guidelines and shall be retrievable by connecting a laptop computer to the VDR system. The laptop connection shall be a panel mounted female type B USB connection point, remotely mounted in the left side foot well.

#### ACCESSORY POWER

The electrical distribution panel shall include two (2) power studs. The studs shall be size #10 and each of the power studs shall be circuit protected with a fuse of the specified amperage. One (1) power stud shall be capable of carrying up to a 40-amp battery direct load. One (1) power stud shall be capable of carrying up to a 15-amp ignition switched load. The two (2) power studs shall share one (1) #10 ground stud. A 225-amp battery direct power and ground stud shall be provided and installed on the chassis near the left hand battery box for OEM body connections.

# AUXILIARY ACCESSORY POWER

An auxiliary set of power and ground studs with supporting battery cables shall be provided at the apparatus interface location on the chassis transmission cross member location and labeled "Aerial EPU". The studs and battery cables shall be capable of supplying 600 amps and be wired battery direct.

# ADDITIONAL ACCESSORY POWER

An additional set of power and ground studs shall be provided and installed behind the rocker switch panel. The power and ground stud shall be circuit protected with a 60-amp breaker. The studs shall be 0.38-inch diameter and capable of carrying up to a 60-amp battery direct load.

# EXTRA POWER & GROUND STUD

An extra set of power and ground studs shall be provided and installed behind the switch panel with a 40-amp breaker. The studs shall be 0.38-inch diameter capable of carrying up to a 40-amp load and shall be wired battery direct. The studs shall include an additional 2.00 feet of wire.

# ANCILLARY ACCESSORY POWER

One (1) ancillary six (6) position Blue Sea Systems 5025 blade type fuse panel shall be installed behind the officer's seat. The fuse panel shall be protected by a 40-amp fuse. The panel shall be capable of carrying up to a maximum 40-amp battery direct load.

# EXTERIOR ELECTRICAL TERMINAL COATING

All terminals exposed to the elements will be sprayed with a high visibility protective rubberized coating to prevent corrosion.

## ELECTRICAL SYSTEM WARRANTY

Purchaser shall receive an Electrical System Two (2) Years or 36,000 Miles limited warranty in accordance with, and subject to, warranty certificate RFW0202. The warranty certificate is incorporated by reference into this proposal, and included with this proposal or available upon request.

# ENGINE

The chassis engine shall be a Cummins X15 engine. The X15 engine shall be an in-line six (6) cylinder, four-cycle diesel-powered engine. The engine shall offer a rating of 605 horse power at 1800 RPM and shall be governed at 2100 RPM. The torque rating shall feature 1850 foot pounds of torque at 1000 RPM with 912 cubic inches (14.9 liter) of displacement.

The X15 engine shall feature a VGT<sup>™</sup> Turbocharger, a high-pressure common rail fuel system, fully integrated electronic controls with an electronic governor, and shall be EPA certified to meet the 2021 emissions standards using cooled exhaust gas recirculation and selective catalytic reduction technology.

The engine shall include an engine mounted combination full flow/by-pass oil filter with replaceable spin on cartridge for use with the engine lubrication system. The engine shall include Citgo brand Citgard 500, or equivalent 15W40 CK-4 low ash engine oil which shall be utilized for proper engine lubrication.

A wiring harness shall be supplied ending at the back of the cab. The harness shall include a connector which shall allow an optional harness for the pump panel. The included circuits shall be provided for a tachometer, oil pressure, engine temperature, hand throttle, high idle and a PSG system. A circuit for J1939 data link shall also be provided at the back of the cab.

# CAB ENGINE TUNNEL

The cab interior shall include an integrated engine tunnel constructed of 5052-H32 Marine Grade 0.19 of an inch thick aluminum alloy plate. The tunnel shall be a maximum of 46.50 inches wide X 29.00 inches high.

# DIESEL PARTICULATE FILTER CONTROLS

There shall be two (2) controls for the diesel particulate filter. One (1) control shall be for regeneration and one (1) control shall be for regeneration inhibit. Each switch shall include a guard.

# ENGINE PROGRAMMING HIGH IDLE SPEED

The engine high idle control shall maintain the engine idle at approximately 1250 RPM when engaged.

# ENGINE HIGH IDLE CONTROL

The vehicle shall be equipped with a virtual Vista button and an automatic high-idle speed control. It shall be pre-set so when activated, it will operate the engine at the appropriate RPM to increase alternator output. This device shall operate only when the engine is running and the transmission is in neutral with the parking brake set. The device shall disengage when the operator depresses the brake pedal, or the transmission is placed in gear, and shall be available to manually or automatically re-engage when the brake is released, or when the transmission is placed in neutral. There shall be an indicator on the Vista display and control screen for the high idle speed control.

# ENGINE PROGRAMMING ROAD SPEED GOVERNOR

The engine shall include programming which will govern the top speed of the vehicle.

# **AUXILIARY ENGINE BRAKE**

A compression brake, for the six (6) cylinder engine shall be provided. A cutout relay shall be installed to disable the compression brake when in pump mode or when an ABS event occurs. The engine compression brake shall activate upon 0% accelerator when in operation mode and actuate the vehicle's brake lights.

The engine shall utilize a variable geometry turbo (VGT) as an integrated auxiliary engine brake to offer a variable rate of exhaust flow, which when activated in conjunction with the compression brake shall enhance the engine's compression braking capabilities.

# AUXILIARY ENGINE BRAKE CONTROL

An engine compression brake control device shall be included. The electronic control device shall monitor various conditions and shall activate the engine brake only if all of the following conditions are simultaneously detected:

- A valid gear ratio is detected.
- The driver has requested or enabled engine compression brake operation.
- The throttle is at a minimum engine speed position.
- The electronic controller is not presently attempting to execute an electronically controlled final drive gear shift.

The compression brake shall be controlled via an off/low/high virtual button through the Vista display and control screen. The multiplex system shall remember and default to the last engine brake control setting when the vehicle is shut off and re-started.

# **ELECTRONIC ENGINE OIL LEVEL INDICATOR**

The engine oil shall be monitored electronically and shall send a signal to activate a warning in the instrument panel when levels fall below normal. The warning shall activate in a low oil situation upon turning on the master battery and ignition switches without the engine running.

# FLUID FILLS

The front of the chassis shall accommodate fluid fill for the engine oil through the grille. This area shall also accommodate a check for the engine oil. The transmission, power steering, and coolant fluid fills and checks shall be under the cab. The windshield washer fill shall be accessible through the front left side mid step.

### **ENGINE DRAIN PLUG**

The engine shall include an original equipment manufacturer installed oil drain plug.

# **ENGINE WARRANTY**

The Cummins engine shall be warranted for a period of five (5) years or 100,000 miles, whichever occurs first.

# ENGINE PROGRAMMING REMOTE THROTTLE

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

## ENGINE PROGRAMMING IDLE SPEED

The engine low idle speed will be programmed at 700 rpm.

# **ENGINE AIR INTAKE**

The engine air intake system shall include an ember separator. This ember separator shall be designed to protect the downstream air filter from embers using a combination of unique flat and crimped metal screens packaged in a heavy-duty galvanized steel frame. This multilayered screen shall trap embers and allow them to burn out before passing through the pack.

The engine air intake system shall also include an air cleaner mounted above the radiator. This air cleaner shall utilize a replaceable dry type filter element designed to prevent dust and debris from being ingested into the engine. A service cover shall be provided on the housing, reducing the chance of contaminating the air intake system during air filter service.

The air intake system shall include a restriction indicator light in the warning light cluster on the instrument panel, which shall activate when the air cleaner element requires replacement.

### **ENGINE FAN DRIVE**

The engine cooling system fan shall incorporate a thermostatically controlled, Horton fully variable type fan drive with SmartClutch J-1939 CAN controller.

The variable speed fan clutch only engages at the amount needed for proper cooling to facilitate improved vehicle performance, cab heating in cold climates, and fuel economy. The fan clutch design shall be fail-safe so that if the clutch drive fails the fan shall engage to prevent engine overheating due to the fan clutch failure. The fan speed shall include a J-1939 CAN clutch controller to receive signal from the engine control module to activate at variable rates of speed. Variable speeds shall be set through thermostatic and engine speed signals to run as efficiently and quietly as required to maintain temperature.

# ENGINE COOLING SYSTEM

There shall be a heavy-duty aluminum cooling system designed to meet the demands of the emergency response industry. The cooling system shall have the capacity to keep the engine properly cooled under all conditions of road and pumping operations. The cooling system shall be designed and tested to meet or exceed the requirements specified by the engine and transmission manufacturer and all EPA requirements. The cooling system shall be mounted to isolate the entire system from vibration or stress. The individual cores of the cooling system shall be mounted in a manner to allow expansion and contraction at various rates without inducing stress into the adjoining cores.

The cooling system shall be comprised of a charge air cooler to radiator serial flow package that provides the maximum cooling capacity for the specified engine as well as serviceability. The main components shall include a surge tank; a charge air cooler bolted to the front of the radiator, recirculation shields, a shroud, a fan, and required tubing.

The radiator shall be a down-flow design constructed with aluminum cores, plastic end tanks, and a steel frame. The radiator shall be equipped with a drain cock to drain the coolant for serviceability.

The cooling system shall include a one piece injected molded polymer fan with a three (3) piece fiberglass fan shroud.

The cooling system shall be equipped with a surge tank that is capable of removing entrained air from the system. The surge tank shall be equipped with a low coolant probe and rearward oriented sight glass to observe coolant in the system. A cold fill and observation line shall be included within the frame mounted translucent recovery bottle to monitor the level of the coolant. The surge tank shall have a dual seal cap that meets the engine manufacturer's pressure requirements and allows for expansion and recovery of coolant into a separate integral expansion chamber.

All radiator tubes shall be formed from aluminized steel tubing. Recirculation shields shall be installed where required to prevent heated air from reentering the cooling package and affecting performance.

The charge air cooler shall be a cross-flow design constructed completely of aluminum with cast tanks. All charge air cooler tubes shall be formed from aluminized steel tubing and installed with silicone hump hoses and stainless steel "constant torque" style clamps meeting the engine manufacturer's requirements.

The radiator and charge air cooler shall be removable through the bottom of the chassis.

# ENGINE COOLING SYSTEM PROTECTION

The engine cooling system shall include a recirculation shield designed to act as a light duty skid plate below the radiator to provide additional protection for the engine cooling system from light impacts, stones, and road debris. The skid plate shall be painted to match the frame components.

### ENGINE COOLANT

The cooling package shall include Extended Life Coolant (ELC). The use of ELC provides longer intervals between coolant changes over standard coolants providing improved performance. The coolant shall contain a 50/50 mix of ethylene glycol and de-ionized water to keep the coolant from freezing to a temperature of -34 degrees Fahrenheit.

Proposals offering supplemental coolant additives (SCA) shall not be considered, as this is part of the extended life coolant makeup.

#### ENGINE COOLANT FILTER

An engine coolant filter with a shut-off valve for the inlet and outlet shall be installed on the chassis. The location of the filter shall allow for easy maintenance.

Proposals offering engines equipped with coolant filters shall be supplied with standard non-chemical type particulate filters.

# ELECTRONIC COOLANT LEVEL INDICATOR

The instrument panel shall feature a low engine coolant indicator light which shall be located in the center of the instrument panel. An audible tone alarm shall also be provided to warn of a low coolant incident.

#### COOLANT HOSES

The cooling systems hose shall be formed silicone hose and formed aluminized steel tubing and include stainless steel constant torque band clamps.

# ENGINE COOLANT OVERFLOW BOTTLE

A remote engine coolant overflow expansion bottle shall be provided in the case of over filling the coolant system. The overflow bottle shall capture the expansion fluid or overfill rather than allow the fluid to drain on the ground.

# ENGINE EXHAUST SYSTEM

The exhaust system shall include an end-in end-out horizontally mounted single module after treatment device, and downpipe from the charge air cooled turbo. The single module shall include four temperature sensors, diesel particulate filter (DPF), urea dosing module (UL2), and a selective catalytic reduction (SCR) catalyst to meet current EPA standards. The selective catalytic reduction catalyst utilizes a diesel exhaust fluid solution consisting of urea and purified water to convert NOx into nitrogen, water, and trace amounts of carbon dioxide. The solution shall be mixed and injected into the system through the DPF and SCR.

The system shall utilize 0.07-inch-thick stainless-steel exhaust tubing between the engine turbo and the DPF. Zero leak clamps seal all system joints between the turbo and DPF.

The single module after treatment through the end of the tailpipe shall be connected with zero leak clamps. The discharge shall terminate horizontally on the right side of the vehicle ahead of the rear tires.

The exhaust system after treatment module shall be mounted below the frame in the outboard position.

# DIESEL EXHAUST FLUID TANK

The exhaust system shall include a molded cross linked polyethylene tank for Diesel Exhaust Fluid (DEF). The tank shall have a capacity of six (6) usable gallons and shall be mounted on the left hand side of the chassis frame behind the batteries below the frame.

The DEF tank shall be designed with capacity for expansion in case of fluid freezing. Engine coolant, which shall be thermostatically controlled, shall be run through lines in the tank to help prevent the DEF from freezing and to provide a means of thawing the fluid if it should become frozen.

The tank fill tube shall be routed under the rear of the cab with the fill neck and splash guard accessible in the top rear step. The backside of the access door shall include a label that states "DEF Fluid only - 6 Gallon Capacity."

# ENGINE EXHAUST ACCESSORIES

An exhaust temperature mitigation device shall be shipped loose for installation by the body manufacturer on the vehicle. The temperature mitigation device shall lower the temperature of the exhaust by combining ambient air with the exhaust gasses at the exhaust outlet.

# ENGINE EXHAUST WRAP

The exhaust tubing between the engine turbo and the diesel particulate filter (DPF) shall be wrapped with a thermal cover in order to retain the necessary heat for DPF regeneration. The exhaust wrap shall also help protect surrounding components from radiant heat which can be transferred from the exhaust.

The exhaust flex joint shall not include the thermal exhaust wrap.

# EMISSIONS SYSTEMS WARRANTY

Purchaser shall receive a Regulated Emissions Systems Five (5) Years or 100,000 Miles limited warranty in accordance with, and subject to, warranty certificate RFW0140. The warranty certificate is incorporated by reference into this proposal, and included with this proposal or available upon request.

# **TRANSMISSION**

The drive train shall include an Allison model EVS 4000 torque converting, automatic transmission which shall include electronic controls and an output retarder. The transmission shall feature two (2) 10-bolt PTO pads located on the converter housing.

The transmission shall include two (2) internal oil filters which shall offer Allison formulated Castrol TranSynd<sup>™</sup> synthetic transmission fluid which shall be utilized in the lubrication of the EVS transmission. An electronic oil level sensor shall be included with the readout located in the shift selector.

The transmission gear ratios shall be:

 1st
 3.51:1

 2nd
 1.91:1

 3rd
 1.43:1

 4th
 1.00:1

 5th
 0.74:1

 6th
 0.64:1 (if applicable)

 Rev
 4.80:1

### TRANSMISSION MODE PROGRAMMING

The transmission, upon start-up, will automatically select a four (4) speed operation. The fifth speed over drive shall be available with the activation of the mode button on the shifting pad.

### TRANSMISSION FEATURE PROGRAMMING

The Allison Gen V/VI-E transmission EVS group package number 127 shall contain the 227 vocational package in consideration of the duty of this apparatus for rescue. This package shall incorporate an automatic neutral with selector override. This feature commands the transmission to neutral when the park brake is applied, regardless of drive range requested on the shift selector. This requires re-selecting drive range to shift out of neutral for the override.

A transmission interface connector shall be provided in the cab. This package shall contain the following input/output circuits to the transmission control module. The Gen V/VI-E transmission shall include prognostic diagnostic capabilities. These capabilities shall include the monitoring of the fluid life, filter change indication, and transmission clutch maintenance.

Function ID	<u>Description</u>	Wire assignment
Inputs		
C	PTO Request	143
F	Aux. Function Range Inhibit (Special)	101/142
Outputs		
G	PTO Enable Output (See Input Function C)	130
S	Neutral Indicator for PTO	145
	Signal Return	103

#### TRANSMISSION SHIFT SELECTOR

An Allison pressure sensitive range selector touch pad shall be provided and located to the right of the driver within clear view and easy reach. The shift selector shall have a graphical Vacuum Florescent Display (VFD) capable of displaying two lines of text. The shift selector shall provide mode indication and a prognostic indicator (wrench symbol) on the digital display. The prognostics monitor various operating parameters and shall alert you when a specific maintenance function is required.

# ELECTRONIC TRANSMISSION OIL LEVEL INDICATOR

The transmission fluid shall be monitored electronically and shall send a signal to activate a warning in the instrument panel when levels fall below normal.

## TRANSMISSION RETARDER CONTROL

The Allison transmission retarder shall be engaged with the first one-third at 0% throttle and the remaining twothirds shall be modulated by brake pedal actuation. The system shall include a retarder on/off virtual button on the Vista display and control screen. The engagement of the retarder shall activate the brake lights. The retarder shall be inactive during pump mode.

### TRANSMISSION RETARDER CAPACITY LEVEL

The transmission retarder shall be programmed so the maximum retardation shall be at the high capacity level.

#### TRANSMISSION PRE-SELECT WITH AUXILIARY BRAKE

When the auxiliary brake is engaged, the transmission shall automatically shift to second gear to decrease the rate of speed assisting the secondary braking system and slowing the vehicle.

### TRANSMISSION COOLING SYSTEM

The transmission shall include a water to oil cooler system located in the cooling loop between the radiator and the engine. The transmission cooling system shall meet all transmission manufacturer requirements. The transmission cooling system shall feature continuous flow of engine bypass water to maintain uninterrupted transmission cooling.

#### TRANSMISSION DRAIN PLUG

The transmission shall include an original equipment manufacturer installed magnetic transmission fluid drain plug.

### TRANSMISSION WARRANTY

The Allison EVS series transmission shall be warranted for a period of five (5) years with unlimited mileage. Parts and labor shall be included in the warranty.

# LH PTO

A ten (10) bolt standard duty clutched drive PTO shall be provided by the chassis manufacturer and installed on the transmission. Installation shall include mounting of the PTO and wiring the unit with a control switch.

# LH PTO MODEL

A ten (10) bolt Chelsea model 280-GGFJP-B5XD heavy duty transmission driven PTO shall be installed. The clutched shifted PTO is designed specifically for the Allison world transmission and provides an intermittent and continuous torque rating of 360 lb. ft.

# PTO LOCATION

The transmission shall have two (2) power take off (PTO) mounting locations, one (1) in the 8:00 o'clock position and one (1) in the 1:00 o'clock position.

# LH PTO CONTROL

The left hand power take off shall be controlled by the transmission. It will use a virtual button on the Vista display and control screen with text messages. Disable is displayed when switch is off. Enable is displayed when the switch is turned on. Active is displayed when the switch is on with positive engagement of the power take off.

Required operating conditions for enabling this function are:

- Throttle position is low
- Engine speed is within customer specified constant limits
- Transmission output speed is within customer specified constant limits
- Park brake set

# PTO PROGRAMMING

The power take off shall be programmed for operator control such that it shall only engage at or below 900 engine RPM and a transmission output speed of 250 RPM. The PTO shall operate in a range up to 4000 engine RPM or a transmission output speed of 5000 RPM. The PTO programming shall provide for automatic disengagement set at a specified engine speed of 4000 RPM, or transmission output speed of 5000 RPM. The programmed to protect equipment driven from the power take off.

# **DRIVELINE**

All drivelines shall be heavy duty metal tube and equipped with MSI 1810 series universal joints for the main drivelines, and 1710 series for the inter-axle shaft. The shafts shall be dynamically balanced prior to installation to alleviate future vibration. In areas of the driveline where a slip shaft is required, the splined slip joint shall be coated with Glide Coat<sup>®</sup>. The drivelines shall include Meritor brand u-joints with thrust washers.

#### **DRIVELINE GUARDS**

Two (2) driveline guard loops shall be provided and installed to support the driveline shafts for routine maintenance and in the event of a driveline component failure.

# FUEL FILTER/WATER SEPARATOR

The fuel system shall have a Racor GreenMAX 6600R fuel filter/water separator as a primary filter. The fuel filter shall have a drain valve and a see-through cover to allow visual inspection of fuel and filter condition. The Racor 6600R shall meet engine requirements for particulate size, collection capacity, removal efficiency, and water removal efficiency. The filter shall be capable of handling a maximum flow rate of 150 gallons per hour.

A secondary fuel filter shall be included as approved by the engine manufacturer.

An instrument panel lamp and audible alarm which indicates when water is present in the fuel-water separator shall also be included.

# FUEL LINES

The fuel system supply and return lines installed from the fuel tank to the engine shall be black textile braided lines which are reinforced with braided high tensile steel wire. The fuel lines shall be connected with reusable steel fittings.

# FUEL SHUTOFF VALVE

There shall be two (2) fuel shutoff valves which shall be installed, one (1) in the fuel draw line at the primary fuel filter and one (1) in the fuel outlet line at the primary fuel filter to allow the fuel filters to be changed without loss of fuel to the fuel pump.

A third fuel shutoff valve shall be installed in the fuel draw line, near the fuel tank to allow maintenance to be performed with minimal loss of fuel.

### ELECTRIC FUEL PRIMER

Integral to the engine assembly is an electric lift pump that serves the purpose of pre-filter fuel priming.

# FUEL COOLER

An aluminum cross flow air to fuel cooler shall be provided to lower fuel temperature allowing the vehicle to operate at higher ambient temperatures. The fuel cooler shall be located behind the rear axle.

# FUEL TANK

The fuel tank shall have a capacity of sixty-eight (68) gallons and shall measure 35.00 inches in width X 17.00 inches in height X 29.00 inches in length.

The baffled tank shall have a vent port to facilitate venting to the top of the fill neck for rapid filling without "blow-back" and a roll over ball check vent for temperature related fuel expansion and draw.

The tank is designed with dual draw tubes and sender flanges. The tank shall have 2.00-inch NPT fill ports for right or left hand fill. A 0.50-inch NPT drain plug shall be centered in the bottom of the tank.

The fuel tank shall be mounted below the frame, behind the rear axle. Two (2) three-piece strap hanger assemblies with "U" straps bolted midway on the fuel tank front and rear shall be utilized to allow the tank to be easily lowered and removed for service purposes. Rubber isolating pads shall be provided between the tank and the upper tank mounting brackets. Strap mounting studs through the rail, hidden behind the body shall not be acceptable.

#### FUEL TANK MATERIAL AND FINISH

The fuel tank shall be constructed of 12-gauge stainless steel. The exterior of the tank shall be powder coated black and then painted to match the frame components.

All powder coatings, primers and paint shall be compatible with all metals, pretreatments and primers used. The cross hatch adhesion test per ASTM D3359 Method B, results to be 5B minimum. The pencil hardness test per ASTM D3363 shall have a final post-curved pencil hardness of H-2H. The direct impact resistance test per ASTM D2794, results to be 5B minimum.

Any proposals offering painted fuel tanks with variations from the above process shall not be accepted. The film thickness of vendor supplied parts shall also be sufficient to meet the performance standards as stated above.

# FUEL TANK STRAP MATERIAL

The fuel tank straps shall be constructed of #304 stainless steel. The fuel tank straps shall be powder coated black and then painted to match the frame components if possible.

# FUEL TANK FILL PORT

The fuel tank fill ports shall be provided with two (2) left fill ports located one (1) in the forward position and one (1) in the middle position and the right fill port located in the middle position of the fuel tank.

A 1.50-inch diameter hole shall be provided in the left and right frame rails for vent hose routing provisions. The holes shall be located adjacent to the fuel tank and 5.13 inches up from the bottom of each rail.

## FUEL TANK SERVICEABILTY PROVISIONS

The chassis fuel lines shall have additional length provided so the tank can be easily lowered and removed for service purposes. The additional 8.00 feet of length shall be located above the fuel tank and shall be coiled and secured. The fuel line fittings shall be pointed towards the right side (curbside) of the chassis.

# FUEL TANK DRAIN PLUG

A 0.5-inch NPT magnetic drain plug shall be centered in the bottom of the fuel tank.

# FRONT AXLE

The front axle shall be a Hendrickson STEERTEK Non-drive front axle, NXT Fire/Rescue model. The axle shall include a 3.74-inch drop and a 70.87-inch king pin intersection (KPI). The axle shall be a box-shaped fabricated beam with integrated suspension. The axle shall include a conventional style hub with a standard knuckle. The weight capacity for the axle shall be rated to 24,000 pounds.

# FRONT WHEEL BEARING LUBRICATION

The front axle wheel bearings shall be lubricated with oil. The oil level can be visually checked via clear inspection windows in the front axle hubs.

# FRONT SHOCK ABSORBERS

Shock absorbers shall be supplied by the suspension manufacturer and installed on the front axle suspension.

#### FRONT SUSPENSION

The front suspension shall include a parabolic leaf spring pack integrated into the Hendrickson STEERTEK NXT axle consisting of 58.40 inches long and 4.00 inches wide tapered leaf springs and shall feature a military double wrapped front eye. Spring eyes shall have Hendrickson's proprietary threaded pin bushings to increase roll stiffness. The spring capacity shall be rated specifically to the axle configuration from 18,000 and up to 24,000 pounds.

### STEERING COLUMN/ WHEEL

The cab shall include a Douglas Autotech steering column which shall include a seven (7) position tilt, a 2.25-inch telescopic adjustment, and an 18.00 inch, four (4) spoke steering wheel located at the driver's position. The steering wheel shall be covered with black polyurethane foam padding.

The steering column shall contain a horn button, self-canceling turn signal switch, four-way hazard switch and headlamp dimmer switch.

# ELECTRONIC POWER STEERING FLUID LEVEL INDICATOR

The power steering fluid shall be monitored electronically and shall send a signal to activate an audible alarm and visual warning in the instrument panel when fluid level falls below normal.

# POWER STEERING PUMP

The hydraulic power steering pump shall be a TRW PS and shall be gear driven from the engine. The pump shall be a balanced, positive displacement, sliding vane type. The power steering system shall include an oil to air passive cooler.

### FRONT AXLE CRAMP ANGLE

The chassis shall have a front axle cramp angle of 45-degrees to the left and 43-degrees to the right.

## **POWER STEERING GEAR**

The power steering gear shall be a TRW model TAS 85 with an assist cylinder.

### CHASSIS ALIGNMENT

The chassis frame rails shall be measured to insure the length is correct and cross checked to make sure they run parallel and are square to each other. The front and rear axles shall be laser aligned. The front tires and wheels shall be aligned and toe-in set on the front tires by the chassis manufacturer.

# REAR AXLE

The rear axle shall be a Meritor model RT-52-185 tandem drive axle. The axle shall include precision forged, single reduction differential gearing, and shall have a fire service rated capacity of 54,000 pounds.

The axle shall be built of superior construction and quality components to provide the rugged dependability needed to stand up to the fire industry's demands. The axle shall include rectangular shaped, hot-formed housing with a standard wall thickness of 0.56 of an inch for extra strength and rigidity and a rigid differential case for high axle strength and reduced maintenance.

The axle shall have heavy-duty Hypoid gearing for longer life, greater strength and quieter operation. Industrystandard wheel ends for compatibility with both disc and drum brakes, and unitized oil seal technology to keep lubricant in and help prevent contaminant damage will be used.

#### **REAR AXLE DIFFERENTIAL LUBRICATION**

The rear axle differential shall be lubricated with oil.

#### **REAR AXLE WARRANTY**

The rear axle shall be warranted by Meritor for five (5) years with unlimited miles under the general service application. Details of the Meritor warranty are provided on the PDF document attached to this option.

#### WHEEL HUB PAINT

Each of the wheel hubs shall be coated with gloss black paint.

#### **REAR WHEEL BEARING LUBRICATION**

The rear axle wheel bearings shall be lubricated with oil.

# REAR AXLE DIFFERENTIAL CONTROL

The tandem axle chassis shall include an inter-axle differential lock, which will allow both axles to be engaged as drive axles. The differential lock shall be controlled by a locking rocker switch on the switch panel. The light on the switch shall illuminate with positive engagement of the inter-axle differential control.

A driver controlled differential lock shall be installed on one of the tandem rear axles. This feature shall allow the main differential to be locked and unlocked when encountering poor road or highway conditions, where maximum traction is needed, for use at speeds no greater than 25 MPH. The driver controlled differential lock shall be controlled by a separate locking rocker switch on the switch panel. The light on the switch shall illuminate with positive engagement of the differential control.

# VEHICLE TOP SPEED

The top speed of the vehicle shall be approximately 65 MPH  $\pm$  2 MPH at governed engine RPM.

### **REAR SUSPENSION**

The tandem rear axle shall feature a Hendrickson Firemaax<sup>TM</sup> air suspension. Each axle will be independently suspended for optimum performance. The suspension shall include four optimized air springs mounted to cast structural trailing arms, transverse cross beams for increased roll stability and four heavy duty shock absorbers. Dual air height control valves shall be installed on each axle to ensure equal frame height on both sides of the vehicle regardless of the load. Axle alignment is maintained using four eccentric bushings at each frame bracket. The rear tandem suspension shall have 54.00-inch axle centers.

The rear suspension capacity shall be rated at 48,001 to 54,000 pounds

# **REAR SHOCK ABSORBERS**

Shock absorbers shall be supplied by the suspension manufacturer and installed on the rear axle suspension.

# TIRE INTERMITTENT SERVICE RATING

The chassis shall be rated using Intermittent Service ratings provided to the emergency vehicle market by the tire manufacturers as the basis for determining the maximum vehicle load and speed.

#### FRONT TIRE

The front tires shall be Michelin 425/65R-22.5 20PR "L" tubeless radial XZY3 mixed service tread.

The front tire stamped load capacity shall be 22,800 pounds per axle with a nominal speed rating of 65 miles per hour when properly inflated to 120 pounds per square inch.

The Michelin Intermittent Service Rating maximum load capacity shall be 24,396 pounds per axle with a maximum speed of 65 miles per hour when properly inflated to 120 pounds per square inch.

The Michelin Intermittent Service Rating maximum speed capacity shall be 22,800 pounds per axle with a speed rating of 75 miles per hour when properly inflated to 120 pounds per square inch.

The Michelin Intermittent Service Rating limits the operation of the emergency vehicle to no more than fifty (50) miles of continuous operation under maximum recommended payload, or without stopping for at least twenty (20) minutes. The emergency vehicle must reduce its speed to no more than 50 MPH after the first fifty (50) miles of travel.

## **REAR TIRE**

The rear tires shall be Michelin 12R-22.5 16PR "H" tubeless radial XDN2 all-weather tread.

The rear tire stamped load capacity shall be 27,120 pounds per axle with a nominal speed rating of 75 miles per hour when properly inflated to 120 pounds per square inch.

The Michelin Intermittent Service Rating maximum load capacity shall be 29,020 pounds per axle with a maximum speed of 75 miles per hour when properly inflated to 120 pounds per square inch.

The Michelin Intermittent Service Rating maximum speed capacity shall match the nominal speed rating.

The Michelin Intermittent Service Rating limits the operation of the emergency vehicle to no more than fifty (50) miles of continuous operation under maximum recommended payload, or without stopping for at least twenty (20) minutes. The emergency vehicle must reduce its speed to no more than 50 MPH after the first fifty (50) miles of travel.

#### REAR AXLE RATIO

The rear axle ratio shall be 4.89:1.

#### FRONT WHEEL

The front wheels shall be Alcoa hub piloted, 22.50-inch X 12.25-inch aluminum wheels. The outer face of the wheels shall feature Alcoa's Dura-Bright<sup>®</sup> finish as an integral part of the wheel surface. Alcoa Dura-Bright<sup>®</sup> wheels keep their shine without polishing. Brake dust, grime and road debris are easily removed by simply cleaning the wheels with soap and water. The hub piloted mounting system shall provide easy installation and shall include two-piece flange nuts.

### **REAR WHEEL**

The rear wheels shall be Alcoa hub piloted, 22.50-inch X 8.25-inch aluminum wheels with a polished outer surface and Alcoa Dura-Bright® wheel treatment as an integral part of the wheel surface. The inner rear wheels shall be Alcoa hub piloted, 22.50-inch X 8.25-inch aluminum wheels with a bright machine finish. The hub piloted mounting system shall provide easy installation and shall include two-piece flange nuts.

#### **BALANCE WHEELS AND TIRES**

All of the wheels and tires, including any spare wheels and tire assemblies, shall be dynamically balanced.

#### WHEEL TRIM

The front wheels shall include stainless steel baby moons shipped loose with the chassis for installation by the apparatus builder. The baby moons shall have cutouts for oil seal viewing when applicable. The wheel nuts shall include Wheel-Check style red loose wheel nut indicators.

The rear wheels shall include band mounted spring clip stainless steel high hats shipped loose with the chassis for installation by the apparatus builder. The wheel nuts shall include Wheel-Check style green loose wheel nut indicators.

The baby moons and high hats shall be RealWheels<sup>®</sup> brand constructed of 304L grade, non-corrosive stainless steel with a mirror finish. Each wheel trim component shall meet D.O.T. certification.

## WHEEL GUARDS

The rear dual wheels shall include a plastic isolator approximately 0.04" installed between the inner and outer wheel hub to help prevent corrosion caused by metal to metal contact. There shall also be a plastic isolator between the axle hub and the wheels on both front and rear axles.

# BRAKE SYSTEM

A rapid build-up air brake system shall be provided. The air brakes shall include, at a minimum, a three (3) air tank, four (4) reservoir system with a total of 6236 cubic inch of air capacity. A floor mounted treadle valve shall be mounted inside the cab for graduated control of applying and releasing the brakes. An inversion valve shall be installed to provide a service brake application in the unlikely event of primary air supply loss. All air reservoirs provided on the chassis shall be labeled for identification.

The tandem rear axle spring brakes shall automatically apply in any situation when the air pressure falls below 25 PSI and shall include a mechanical means for releasing the spring brakes when necessary. An audible alarm shall designate when the system air pressure is below 60 PSI.

A six (6) sensor, six (6) modulator Anti-lock Braking System (ABS) shall be installed on the front and tandem rear axles in order to prevent the brakes from locking or skidding while braking during hard stops or on icy or wet surfaces. This in turn shall allow the driver to maintain steering control under heavy braking and in most instances, shorten the braking distance. The electronic monitoring system shall incorporate diagonal circuitry which shall monitor wheel speed during braking through a sensor and tone ring on each wheel. A dash mounted ABS lamp shall be provided to notify the driver of a system malfunction. The ABS system shall automatically disengage the auxiliary braking system device when required. The speedometer screen shall be capable of reporting all active defaults using PID/SID and FMI standards.

Additional safety shall be accommodated through Automatic Traction Control (ATC) which shall be installed on the tandem rear axle. The ATC system shall apply the ABS when the drive wheels loose traction. The system shall scale the electronic engine throttle back to prevent wheel spin while accelerating on ice or wet surfaces.

A virtual style switch shall be provided and properly labeled "mud/snow". When the switch is pressed once, the system shall allow a momentary wheel slip to obtain traction under extreme mud and snow conditions. During this condition the ATC light shall blink continuously notifying the driver of activation. Pressing the switch again shall deactivate the mud/snow feature.

The Electronic Stability Control (ESC) unit is a functional extension of the electronic braking system. It is able to detect any skidding of the vehicle about its vertical axis as well as any rollover tendency. The control unit comprises an angular-speed sensor that measures the vehicle's motion about the vertical axis, caused, for instance, by cornering or by skidding on a slippery road surface. An acceleration sensor measures the vehicle's lateral acceleration. The Controller Area Network (CAN) bus provides information on the steering angle. On the basis of lateral acceleration and steering angle, an integrated microcontroller calculates a theoretical angular speed for the stable vehicle condition.

# FRONT BRAKES

The front brakes shall be Meritor EX225 Disc Plus disc brakes with 17.00-inch vented rotors.

#### REAR BRAKES

The rear brakes shall be Meritor 16.50-inch X 7.00-inch S-cam drum type. The brakes shall feature a cast iron shoe.

### PARK BRAKE

Upon application of the push-pull valve in the cab, the rear brakes will engage via mechanical spring force. This is accomplished by dual chamber rear brakes, satisfying the FMVSS parking brake requirements.

# SUPPLEMENTAL BRAKE

A supplemental brake engagement shall be supplied that can only be engaged while the rear spring brakes are engaged. In addition to the mechanical rear brake engagement, the front service brakes shall also be engaged via air pressure, providing additional braking capability. Front service brake activation shall be accomplished with activation of the rear mechanical park brake valve.

# PARK BRAKE CONTROL

A Meritor-Wabco manual hand control push-pull style valve shall operate the parking brake.

The parking brake actuation valve shall be mounted to the left side of the engine tunnel integrated into the transmission shift pod console within easy access of the driver. The control shall include a protective guard which shall prevent accidental activation of the parking brake and still allow proper actuation of the control.

#### **REAR BRAKE SLACK ADJUSTERS**

Haldex rear brake automatic slack adjusters shall be installed on the axle.

# **REAR BRAKE DUST SHIELDS**

The rear brakes shall be equipped with brake dust shields.

# AIR DRYER

The brake system shall include a Wabco System Saver 1200 air dryer with an integral heater with a Metri-Pack sealed connector. The air dryer incorporates an internal turbo cutoff valve that closes the path between the air compressor and air dryer purge valve during the compressor "unload" cycle. The turbo cutoff valve allows purging of moisture and contaminants without the loss of turbo boost pressure. The air dryer shall be mounted to the frame behind the battery box on the left hand side outboard on an aerial apparatus bracket.

# FRONT BRAKE CHAMBERS

The front brakes shall be provided with type 24 brake chambers as supplied with the Hendrickson STEERTEK NXT axle.

# **REAR BRAKE CHAMBERS**

The rear axle shall include TSE 30/30 H.O.T. (High Output Technology) brake chambers shall convert the energy of compressed air into mechanical force and motion. This shall actuate the brake camshaft, which in turn shall operate the foundational brake mechanism forcing the brake shoes against the brake drum. The TSE 30/30 H.O.T. chambers are designed to provide the same performance as 30/36 chambers in a smaller package.

#### AIR COMPRESSOR

The air compressor provided for the engine shall be a Wabco<sup>®</sup> SS318 single cylinder pass-through drive type compressor which shall be capable of producing 18.7 CFM at 1200 engine RPMs. The air compressor shall feature a higher delivery efficiency translating to more air delivery per horsepower absorbed. The compressor shall include an aluminum cylinder head which shall improve cooling, reduce weight and decrease carbon formation. Superior piston and bore finishing technology shall reduce oil consumption and significantly increasing the system component life.

## AIR GOVERNOR

An air governor shall be provided to control the cut-in and cut-out pressures of the engine mounted air compressor. The governor shall be calibrated to meet FMVSS requirements. The air governor shall be located on the air dryer bracket.

### AUXILIARY AIR RESERVOIR

One (1) auxiliary air reservoir with a 1200 cubic inch capacity shall be installed on the chassis to act as an additional reserve supply to the air system for air horn, air tool, or other non-service brake use. The reservoir shall be isolated with a 90 PSI pressure protection valve on the reservoir supply side to prevent depletion of the air to the air brake system.

### **MOISTURE EJECTORS**

An automatic moisture ejector with a manual cable actuated drain provision shall be installed on the wet tank of the air supply system. Manual cable actuated drain valves shall be installed on all remaining reservoirs of the air supply system. The actuation pull cables shall be coiled and tied at each drain valve. The supplied cables when extended shall be sufficient in length to allow each drain to be activated from the side of the apparatus.

### AIR SUPPLY LINES

The air system on the chassis shall be plumbed with color coded reinforced nylon tubing air lines. The primary (rear) brake line shall be green, the secondary (front) brake line red, the parking brake line orange and the auxiliary (outlet) will be blue.

Brass compression type fittings shall be used on the nylon tubing. All drop hoses shall include fiber reinforced neoprene covered hoses.

#### AIR HORN SHUTOFF VALVE

A shut-off valve shall be installed in the air horn supply line under the bumper extension.

#### AIR TANK SPACERS

There shall be spacers included with the air tank mounting. The spacers shall move the air tanks 1.50 inches inward towards the center of the chassis. This shall provide clearance between the air tanks and the frame for body U-bolt clearance.

### **WHEELBASE**

The chassis wheelbase shall be 244.00 inches.

#### **REAR OVERHANG**

The chassis rear overhang shall be 106.00 inches.

# FRAME

The frame shall consist of triple side rails and cross members forming a ladder style frame. The side rails shall be formed in the shape of a "C" channel, with the outer rail measuring 10.25 inches high X 3.50 inches deep X 0.38 inches thick, with an inner channel 9.44 inches high X 3.13 inches deep X 0.38 inches thick, and a second inner channel, 8.55 inches high X 2.75 inches deep X 0.25 inches thick which shall be provided extending from the rear of the cab to the forward rear suspension cross member. Each rail shall be constructed of 110,000 psi minimum yield high strength low alloy steel. The triple rail section shall be rated by a Resistance Bending Moment (RBM) minimum of 3,921,500-inch pounds and have a minimum section modulus of 35.65 cubic inches. The frame shall measure 35.00 inches in width.

Proposals calculating the frame strength using the "box method" shall not be considered.

Proposals including heat treated rails shall not be considered. Heat treating frame rails produces rails that are not uniform in their mechanical properties throughout the length of the rail. Rails made of high strength, low alloy steel are already at the required yield strength prior to forming the rail.

A minimum of seven (7) fully gusseted 0.25-inch-thick cross members shall be installed. The inclusion of the body mounting, or bumper mounting shall not be considered as a cross member. The cross members shall be attached using zinc coated grade 8 fasteners. The bolt heads shall be flanged type, held in place by distorted thread flanged lock nuts. Each cross member shall be mounted to the frame rails utilizing a minimum of 0.25-inch-thick gusset reinforcement plates at all corners balancing the area of force throughout the entire frame.

Any proposals not including additional reinforcement for each cross member shall not be considered.

All relief areas shall be cut in with a minimum 2.00-inch radius at intersection points with the edges ground to a smooth finish to prevent a stress concentration point.

## FRAME CLEAR AREA

The chassis frame shall be left clear of chassis mounted components inside or outside the frame rails within the first 30.00 inches behind the cab to allow space for OEM installed components. Cross members may be installed in the clear area if required for proper frame or driveline configuration.

# FRAME PAINT

The frame rails shall be hot dip galvanized and powder coated prior to assembly and attachment of any components. The components that shall be galvanized shall include:

• Main frame "C" channel or channels

The frame parts which are not galvanized shall be powder coated prior to any attachment of components. Parts which shall be powder coated shall include but are not limited to:

- Steering gear bracket
- Front splayed rails and fish plates
- Bumper extensions
- Cross members
- Cross member gussets
- Fuel tank mounting brackets
- Fuel tank straps (unless material/finish is specified in 3130 subcat)
- Air tanks (unless color coded tanks are specified in 3205 subcat)
- Air tank mounting brackets
- Exhaust mounting brackets
- Air cleaner skid plate

- Radiator skid plate
- Battery supports, battery trays and battery covers

Other non-galvanized under carriage components which are received from the suppliers with coatings already applied shall include but are not limited to:

- Suspension components
- Front and rear axles

All powder coatings, primers and paint used on the non-galvanized components shall be compatible with all metals, pretreatments and primers used. The cross hatch adhesion test per ASTM D3359 shall not have a fail of more than ten (10) squares. The pencil hardness test per ASTM D3363 shall have a final post-curved pencil hardness of H-2H. The direct impact resistance test per ASTM D2794 shall have an impact resistance of 120.00 inches per pound at 2 mils.

The chassis under carriage consisting of frame, axles, driveline running gear, air tanks and other assorted chassis mounted components shall then be painted gloss black SEM Rust Shield anti-rust shielding agent. Paint shall be applied prior to airline and electrical wiring installation.

# FRAME PAINT - MISCELLANEOUS

There shall be an RTV type sealant applied to the seams between the frame rail and the frame liner(s) to help prevent water intrusion between the frame rails. The sealant shall be applied to all seams along the length of the frame and at the top, front, and rear ends of the liner(s). The sealant shall be applied after the frame rails have been assembled and painted.

# FRAME ASSEMBLY STRUCTURAL

Purchaser shall receive a Frame Assembly Structural Fifty (50) Years or 250,000 Miles limited warranty in accordance with, and subject to, warranty certificate RFW0305. The warranty certificate is incorporated by reference into this proposal, and included with this proposal or available upon request.

# FRAME RAIL CORROSION

Purchaser shall receive a Frame Rail Corrosion (Zinc Plate and Powder Coat) Twenty-Five (25) Years or 150,000 Miles limited warranty in accordance with, and subject to, warranty certificate RFW0316. The warranty certificate is incorporated by reference into this proposal, and included with this proposal or available upon request.

# FRAME COMPONENTS CORROSION

Purchaser shall receive a Frame Components Corrosion (Powder Coat) Three (3) Years or 48,000 Miles limited warranty in accordance with, and subject to, warranty certificate RFW0313. The warranty certificate is incorporated by reference into this proposal, and included with this proposal or available upon request.

# **REAR MUD FLAP**

The unit shall be equipped with a temporary wooden fender and mud flap assembly for transport to the body manufacturer.

# FRONT BUMPER

A one piece, two (2) rib wrap-around style, polished stainless-steel front bumper shall be provided. The material shall be 10-gauge 304 stainless steel, 12" high and 104.50 inches wide.

# FRONT BUMPER EXTENSION LENGTH

The front bumper shall be extended approximately 6.00 inches ahead of the cab.

# **MECHANICAL SIREN**

The front bumper shall include an electro mechanical Federal  $Q2B^{TM}$  siren, which shall be streamlined, chromeplated and shall produce 123 decibels of sound at 10.00 feet. The  $Q2B^{TM}$  siren produces a distinctive warning sound that is recognizable at long distances. A unique clutch design provides a longer coast down sound while reducing the amp draw to 100 amps. The siren shall measure 10.50 inches wide X 10.00 inches high X 14.00 inches deep. The siren shall include mounting hardware designed to recess or flush mount.

# **MECHANICAL SIREN LOCATION**

The siren shall be recess mounted in the center on the front fascia of the bumper between the frame rails.

## MECHANICAL SIREN ACCESSORIES

The front of the siren shall include (2) stainless steel flat bars approximately 1.00-inch-wide by 19.00 inches long. Each bar shall be placed vertically on the right and left side of the siren face wrapping around towards the back of the siren into the bumper extension offering protection to the Q2B siren.

### AIR HORN

The front bumper shall include two (2) Hadley brand E-Tone air horns which shall measure 21.00 inches long with a 6.00-inch round flare. The air horns shall be trumpet style with a chrome finish on the exterior and a painted finish deep inside the trumpet.

#### AIR HORN LOCATION

The air horns shall be recess mounted in the front bumper face, one (1) on the right side of the bumper in the inboard position relative to the right hand frame rail and one (1) on the left side of the bumper in the inboard position relative to the left hand frame rail.

#### AIR HORN RESERVOIR

One (1) air reservoir, with a 2084 cubic inch capacity, shall be installed on the chassis to act as a supply tank for operating air horns. The reservoir shall be isolated with a 90 PSI pressure protection valve on the reservoir supply side to prevent depletion of the air to the air brake system.

### ELECTRONIC SIREN SPEAKER

There shall be one (1) Cast Products Inc. model SA4301, 100 watt speaker provided. The speaker shall measure 6.20 inches tall X 7.36 inches wide X 3.06 inches deep. The speaker shall include a flat mounting flange which shall be polished aluminum.

#### **ELECTRONIC SIREN SPEAKER LOCATION**

The electronic siren speaker shall be located on the front bumper face on the right side outboard of the frame rail in the far outboard position.

# FRONT BUMPER TOW HOOKS

Two (2) heavy duty tow hooks, painted to match the frame components, shall be installed behind the front bumper in the forward position, bolted directly to the side of each chassis frame rail with grade 8 bolts.

# **TOW FORK PROVISION**

Two (2) heavy duty steel towing forks shall be bolt-on to the underside of the frame flange and butted to the bottom frame with a fish plate joint. Each shall be shaped like an upside down "U" to act as a designated hookup point to accept a tow bar from a service vehicle without having to reach the front axle. The robust design shall allow a disabled vehicle to be lifted and towed without doing damage to the bumper or bumper mounted options. The provisions shall be mounted directly behind the cab tilt cross member to provide optimal vehicle stability while maintaining access for most heavy duty tow stingers.

# CAB TILT SYSTEM

The entire cab shall be capable of tilting approximately 45-degrees to allow for easy maintenance of the engine and transmission. The cab tilt pump assembly shall be located on the right side of the chassis above the battery box.

The electric-over-hydraulic lift system shall include an ignition interlock and red cab lock down indicator lamp on the tilt control which shall illuminate when holding the "Down" button to indicate safe road operation.

It shall be necessary to activate the master battery switch and set the parking brake in order to tilt the cab. As a third precaution the ignition switch must be turned off to complete the cab tilt interlock safety circuit.

Two (2) spring-loaded hydraulic hold down hooks located outboard of the frame shall be installed to hold the cab securely to the frame. Once the hold-down hooks are set in place, it shall take the application of pressure from the hydraulic cab tilt lift pump to release the hooks.

Two (2) cab tilt cylinders shall be provided with velocity fuses in each cylinder port. The cab tilt pivots shall be 1.90-inch ball and be anchored to frame brackets with 1.25-inch diameter studs.

A steel safety channel assembly, painted safety yellow shall be installed on the right side cab lift cylinder to prevent accidental cab lowering. The safety channel assembly shall fall over the lift cylinder when the cab is in the fully tilted position. A cable release system shall also be provided to retract the safety channel assembly from the lift cylinder to allow the lowering of the cab.

# CAB TILT LIMIT SWITCH

A cab tilt limit switch shall be installed. The switch will effectively limit the travel of the cab when being tilted. The limit adjustment of the switch shall be preset by the chassis manufacturer to prevent damage to the cab or any bumper mounted option mounted in the cab tilt arc. Further adjustment to the limit by the apparatus manufacturer shall be available to accommodate additional equipment.

# CAB TILT CONTROL RECEPTACLE

A six (6) pin Deutsch receptacle that includes a cap shall be installed in the front bumper tail on the right hand side to provide a place to plug in the cab tilt remote control pendant.

The remote control pendant shall include 20.00 feet of cable with a mating Deutsch connector. The remote control pendant shall be shipped loose with the chassis.

# CAB TILT NOISE DAMPENER

In an effort to reduce the amount of noise created by the cab tilt lock down system, sound dampening spray-on materials shall be utilized to insulate contact points in the system to help prevent metallic sounds from occurring while traversing rough roads.

# CAB TILT LOCK DOWN INDICATOR

The cab dash shall include a message located within the dual air pressure gauge which shall alert the driver when the cab is unlocked and ajar. The alert message shall cease to be displayed when the cab is in the fully lowered position and the hold down hooks are secured and locked to the cab mounts.

In addition to the alert message an audible alarm shall sound when the cab is unlocked and ajar and the parking brake is released.

# CAB WINDSHIELD

The cab windshield shall have a surface area of 2969.88 square inches and be of a two (2) piece wraparound design for maximum visibility.

The glass utilized for the windshield shall include standard automotive tint. The left and right windshield shall be fully interchangeable thereby minimizing stocking and replacement costs.

Each windshield shall be installed using black self-locking window rubber.

### **GLASS FRONT DOOR**

The front cab doors shall include a window which is 27.00 inches in width X 26.00 inches in height. These windows shall have the capability to roll down completely into the door housing. This shall be accomplished using electric actuation. The left and right front door windows shall be controlled using a switch on each respective side inner door panel. The driver's door shall include a switch for each powered door window in the cab.

There shall be an irregular shaped fixed window which shall measure 2.50 inches wide at the top, 8.00 inches wide at the bottom X 26.00 inches in height, more commonly known as "cozy glass" ahead of the front door roll down windows.

The windows shall be mounted within the frame of the front doors trimmed with a black anodized ring on the exterior.

# **GLASS TINT FRONT DOOR**

The windows located in the left and right front doors shall have a standard green automotive tint which shall allow seventy-five percent (75%) light transmittance.

# **GLASS REAR DOOR RH**

The rear right hand side crew door shall include a window which is 27.00 inches in width X 26.00 inches in height. The window shall be a powered type and shall be controlled by a switch on the door panel ledge and on the driver's control panel.

#### **GLASS TINT REAR DOOR RIGHT HAND**

The window located in the right hand side rear door shall include a standard green automotive tint which shall allow seventy-five percent (75%) light transmittance.

#### **GLASS REAR DOOR LH**

The rear left hand side crew door shall include a window which is 27.00 inches in width X 26.00 inches in height. The window shall be a powered type and shall be controlled by a switch on the door panel ledge and on the driver's control panel.

# **GLASS TINT REAR DOOR LEFT HAND**

The window located in the left hand side rear door shall include a standard green automotive tint which shall allow seventy-five percent (75%) light transmittance.

# CLIMATE CONTROL

A ceiling mounted combination defroster and cabin heating and air conditioning system shall be located above the engine tunnel area. The system covers and plenums shall be of severe duty design made of aluminum which shall be coated with a customer specified interior paint. The design of the system's covers shall provide quick access to washable air intake filters as well as easy access to other serviceable items.

The air delivery plenums provide targeted airflow directly to the vehicle occupants. Six (6) adjustable louvers will provide comfort for the front seat occupants and ten (10) adjustable louvers will provide comfort for the rear crew occupants.

The system shall be capable of producing up to 12 FPM of air velocity at all occupant seating positions. Separate front and rear blower motors shall be of brushless design and shall be controlled independently. It shall be capable of reducing the interior cabin air temperature from 122° F (+/- 3° F) to 80° F in thirty minutes with 50% relative humidity and full solar load as described in SAE J2646.

The system shall also provide heater pull up performance which meets or exceeds the performance requirements of SAE J1612 as well as defrost performance that meets or exceeds the performance requirements of SAE J381.

A gravity drain system shall be provided that is capable of evacuating condensate from the vehicle while on a slope of up to a 13% grade in any direction.

The air conditioning system plumbing shall be a mixture of custom bent zinc coated steel fittings and Aeroquip flexible hose with Aeroquip EZ-Clip fittings.

The overhead heater/defroster plumbing shall include an electronic flow control valve that re-directs hot coolant away from the evaporator, via a bypass loop, as the temperature control is moved toward the cold position.

Any component which needs to be accessed to perform system troubleshooting shall be accessible by one person using basic hand tools. Regularly serviced items shall be replaceable by one person using basic hand tools.

\*\*The chassis manufacturer recommends that the overall climate system performance be based off third-party testing in accordance with the Society of Automotive Engineering standards as a complete system.

Individual component level BTU ratings is not an accurate indicator of the performance capability of the completed system. System individual component BTU ratings:

- Air conditioning evaporator total BTU/HR: 82,000
- Air conditioning condenser total BTU/HR: 59,000
- Heater coil total BTU/HR: 98,000

Performance data specified is based on testing performed by an independent third-party test facility using a medium four-door 10" raised roof cab equipped with an ISL engine.

# **CLIMATE CONTROL DRAIN**

The climate control system shall include a gravity drain for water management. The gravity drain shall remove condensation from the air conditioning system without additional mechanical assistance.

# **CLIMATE CONTROL ACTIVATION**

The heating, defrosting and air conditioning controls shall be located on the Vista display and control screen.

# HVAC OVERHEAD COVER PAINT

The overhead HVAC cover shall be painted with a multi-tone silver gray texture finish.

#### AUXILIARY CLIMATE CONTROL REAR CREW

One (1) 53,500 BTU heater shall be provided and installed in the rear section of the crew cab under the center forward facing seat riser. The fan controls shall be located on the heater unit.

The auxiliary heater system hoses shall be silicone with stainless steel constant torque clamps approved for use with silicone hose. The auxiliary heater system shall include one (1) seasonal shut-off valve. The valve shall be supplied at the front of the right hand corner of the cab. The cab must be tilted to access the shut-off valve.

#### **HEATER HOSE INSULATION**

The heater hoses leading from the engine to the cab shall include a foam insulation wrap which runs the length of the hose improving heating in extreme cold climates. The heater hoses which shall be routed inside the cab shall not be insulated.

#### A/C CONDENSER LOCATION

A roof mounted A/C condenser shall be installed on the left side of the cab, mid-roof.

### A/C COMPRESSOR

The air-conditioning compressor shall be a belt driven, engine mounted compressor. The compressor shall be compatible with R134-a refrigerant.

\*\*The chassis manufacturer recommends that the overall climate system performance be based off third-party testing in accordance with the Society of Automotive Engineering standards as a complete system.

Individual component level ratings are not an accurate indicator of the performance capability of the completed system.

Refrigerant Compressor displacement: 19.1 cubic inches per revolution.

#### **CAB CIRCULATION FANS FRONT**

The cab shall include two (2) all metal 6.00 inch air circulation fans installed outer front cab corners. Each fan shall be controlled by an individual virtual button on the Vista display and control screen or a toggle switch on each fan. The fans shall automatically activate whenever the HVAC is in defrost mode. The fans can be used to help defog the windshield or to increase air circulation for passenger comfort.

#### **UNDER CAB INSULATION**

The underside of the cab tunnel surrounding the engine shall be lined with multi-layer insulation, engineered for application inside diesel engine compartments.

The insulation shall act as a noise barrier, absorbing noise thus keeping the decibel level in the cab well within NFPA recommendations. As an additional benefit, the insulation shall assist in sustaining the desired temperature within the cab interior.

The engine tunnel insulation shall measure approximately 0.30-inch-thick including a multi-layer foil faced glass cloth and polyester fiber layer. The foil surface acts as protection against heat, moisture and other contaminants. The insulation shall meet or exceed FMVSS 302 flammability test.

The cab floor insulation shall measure approximately 0.30-inch-thick including a multi-layer foil faced glass cloth and polyester fiber layer. The foil surface acts as protection against heat, moisture and other contaminants. The insulation shall meet or exceed FMVSS 302 flammability test.

The insulation shall be cut precisely to fit each section and sealed for additional heat and sound deflection. The insulation shall be held in place by acrylic pressure sensitive adhesive.

The cab floor insulation shall cover the driver and officer floor areas as well as all crew floor areas and compartment floor areas if applicable.

# **INTERIOR TRIM FLOOR**

The floor of the cab shall be covered with a multi-layer mat consisting of 0.25-inch-thick sound absorbing closed cell foam with a 0.06-inch-thick non-slip vinyl surface with a pebble grain finish. The covering shall be held in place by a pressure sensitive adhesive and aluminum trim molding. All exposed seams shall be sealed with silicone caulk matching the color of the floor mat to reduce the chance of moisture and debris retention.

# **INTERIOR TRIM**

The cab interior shall include trim on the front ceiling, rear crew ceiling, and the cab walls. It shall be easily removable to assist in maintenance. The trim shall be constructed of insulated vinyl over a hard board backing.

# **REAR WALL INTERIOR TRIM**

The rear wall of the cab shall be trimmed with vinyl.

# HEADER TRIM

The cab interior shall feature header trim over the driver and officer dash constructed of 5052-H32 Marine Grade, 0.13-inch-thick aluminum.

# TRIM CENTER DASH

The main center dash area shall be constructed of 5052-H32 Marine Grade, 0.13-inch-thick aluminum plate. There shall be four (4) holes located on the top of the dash near each outer edge of the electrical access cover for ventilation. The center dash electrical access cover shall include a gas cylinder stay which shall hold the cover open during maintenance.

# TRIM LH DASH

The left hand dash shall be constructed of 5052-H32 Marine Grade, 0.13-inch-thick aluminum plate for a perfect fit around the instrument panel. For increased occupant protection the extreme duty left hand dash utilizes patent pending break away technology to reduce rigidity in the event of a frontal crash. The left hand dash shall offer lower vertical surface area to the left and right of the steering column to accommodate control panels.

# TRIM RH DASH

The right hand dash shall be constructed of 5052-H32 Marine Grade, 0.13 of an inch thick aluminum plate and shall include a glove compartment with a hinged door and a Mobile Data Terminal (MDT) provision. The glove compartment size will measure 14.00 inches wide X 4.50 inches high X 5.88 inches deep. The MDT provision shall be provided above the glove compartment.

# ENGINE TUNNEL TRIM

The cab engine tunnel shall be covered with a multi-layer mat consisting of 0.25-inch closed cell foam with a 0.06-inch-thick non-slip vinyl surface with a pebble grain finish. The mat shall be held in place by pressure sensitive adhesive. The engine tunnel mat shall be trimmed with anodized aluminum stair nosing trim for an aesthetically pleasing appearance.

## POWER POINT DASH MOUNT

The cab shall include two (2) 12-volt cigarette lighter type receptacles in the switch panel to provide a power source for 12-volt electrical equipment. The cab shall also include one (1) Blue Sea dual universal serial bus (USB) charging receptacle in the cab dash to provide a power source for USB chargeable electrical equipment. The USB port shall be capable of a 5 Volt-2.1-amp total output. The receptacles shall be wired battery direct.

### **AUXILIARY POWER POINT ENGINE TUNNEL**

The cab interior shall include one (1) 12-volt cigarette lighter type receptacle to provide a power source for 12-volt electrical equipment. The receptacle shall be connected directly to the batteries. The receptacle shall be prewired to the rear of the engine tunnel with two (2) feet additional length of wire coiled under the cab, with the receptacle shipped loose for body builder installation.

### STEP TRIM

Each cab entry door shall include a three-step entry. The first step closest to the ground shall be constructed of SAE 304 stainless steel with embossed perforations and diamond shaped cutout. The perforations and cutouts shall allow water and other debris to flow through rather than becoming trapped within the stepping surface. The step shall feature a splash guard to reduce water and debris from splashing in to the step. The splash guard shall have drainage holes beneath the back of the step to allow debris and water to flow through rather than becoming trapped within the stepping surface. The stainless-steel material shall have a number 8 mirror finish. The lower step shall be mounted to a frame which is integral with the construction of the cab for rigidity and strength. The middle step shall be integral with the cab construction and shall be trimmed in 0.08-inch-thick 3003-H22 embossed aluminum tread plate.

### STEP TRIM KICKPLATE

The cab steps shall include a kick plate in the rise of each step. The risers shall be trimmed in 3003-H22 bright aluminum tread-plate which is 0.07 inch thick.

#### UNDER CAB ACCESS DOOR

The cab shall include an access door in the left crew step riser constructed of aluminum tread plate with a push and turn latch. The under cab access door shall provide access to the diesel exhaust fluid fill.

#### **INTERIOR DOOR TRIM**

The interior trim on the doors of the cab shall consist of an aluminum panel constructed of Marine Grade 5052-H32 0.13 of an inch thick aluminum plate. The door panels shall include a painted finish.

### **DOOR TRIM SCUFF PLATE**

The trim along the door shall include a stainless-steel scuff plate along the door jamb to prevent the chipping of paint should the seat belt buckle come in contact with the door jamb.

# DOOR TRIM CUSTOMER NAMEPLATE

The interior door trim on the front doors shall include a customer nameplate which states the vehicle was custom built for their Department.

# CAB DOOR TRIM REFLECTIVE

The interior of each door shall include high visibility reflective tape. A white reflective tape shall be provided vertically along the rear outer edge of the door. The lowest portion of each door skin shall include a reflective tape chevron with red and white stripes and a Spartan logo. The chevron tape shall measure 6.00 inches in height.

# **INTERIOR GRAB HANDLE "A" PILLAR**

There shall be two (2) rubber covered 11.00-inch grab handles installed inside the cab, one on each "A" post at the left and right door openings. The left handle shall be located 7.88 inches above the bottom of the door window opening and the right handle shall be located 2.88 inches above the bottom of the door window opening. The handles shall assist personnel in entering and exiting the cab.

### **INTERIOR GRAB HANDLE FRONT DOOR**

Each front door shall include one (1) ergonomically contoured 9.00-inch cast aluminum handle mounted horizontally on the interior door panels. The handles shall feature a textured black powder coat finish to assist personnel entering and exiting the cab.

# **INTERIOR GRAB HANDLE REAR DOOR**

A black powder coated cast aluminum assist handle shall be provided on the inside of each rear crew door. A 30.00-inch-long handle shall extend horizontally the width of the window just above the window sill. The handle shall assist personnel in exiting and entering the cab.

# ADDITIONAL INTERIOR GRAB HANDLE REAR DOOR

Each rear door shall include one (1) additional grab handle. The handle shall be a 30.00-inch-long one-piece cast aluminum grab handle. Each handle shall be mounted diagonally on the interior door trim panels. Each handle shall be textured and feature a black powder coat finish and shall assist personnel entering and exiting the cab.

# **INTERIOR MID COMPARTMENT**

The cab shall include a compartment located in the middle of the cab behind the engine tunnel adjacent to the rear facing outboard seating positions. This compartment shall measure the full width of the engine tunnel, 33.20 inches high, and approximately 27.50 inches deep over the engine tunnel. The forward wall over the tunnel is designed to match the offset EMS compartment forward wall, if applicable. The depth of the compartment behind the tunnel shall be the full depth of the space between the wheel wells, following the slope of the tunnel as to not protrude into the walking space of the cab. The compartment shall be accessible via a cargo net covered provision that shall include side-release buckle assemblies at the bottom. The interior of the compartment shall be DA sanded aluminum. The exterior compartment finish shall be painted to match the cab interior paint.

# **INTERIOR MID COMPARTMENT SHELF**

The compartment located behind the engine tunnel shall include one (1) aluminum shelf which shall be secured using Unistrut channel on two (2) sides of the interior walls of the compartment. The shelf shall feature a 1.00-inch lip around the edges.

# **INTERIOR MID COMPARTMENT LIGHTING**

There shall be one (1) On Scene Solutions brand Night Axe LED strip light installed to illuminate the interior compartment behind the engine tunnel inside the crew area of the cab. The strip light shall be 27.00 inches long. The strip light shall be rocker switch activated. The switch shall be located on the upper compartment face.

## **INTERIOR MID COMPARTMENT ACCESSORIES**

The compartment located behind the engine tunnel shall include one (1) aluminum tray which shall feature a 2.00-inch lip surrounding the edges of the tray for the storage of items within this area.

### **INTERIOR SOFT TRIM COLOR**

The cab interior soft trim surfaces shall be gray in color.

#### **INTERIOR TRIM SUNVISOR**

The header shall include two (2) sun visors, one each side forward of the driver and officer seating positions above the windshield. Each sun visor shall be constructed of Masonite and covered with padded vinyl trim.

### **INTERIOR FLOOR MAT COLOR**

The cab interior floor mat shall be gray in color.

### CAB PAINT INTERIOR DOOR TRIM

The inner door panel surfaces shall be painted with multi-tone silver gray texture finish.

#### HEADER TRIM INTERIOR PAINT

The metal surfaces in the header area shall be coated with multi-tone silver gray texture finish.

#### TRIM CENTER DASH INTERIOR PAINT

The entire center dash shall be coated with multi-tone silver gray texture finish. Any accessory pods attached to the dash shall also be painted this color.

#### TRIM LH DASH INTERIOR PAINT

The left hand dash shall be painted with a multi-tone silver gray texture finish.

### TRIM RIGHT HAND DASH INTERIOR PAINT

The right hand dash shall be painted with multi-tone silver gray texture finish.

#### DASH PANEL GROUP

The main center dash area shall include three (3) removable panels located one (1) to the right of the driver position, one (1) in the center of the dash and one (1) to the left of the officer position. The center panel shall be within comfortable reach of both the driver and officer.

#### SWITCHES CENTER PANEL

The center dash panel shall include six (6) switch positions in the upper left portion of the panel.

A rocker switch with a blank legend installed directly above shall be provided for any position without a switch and legend designated by a specific option. The non-specified switches shall be two-position, black switches with a green indicator light. Each blank switch legend can be custom engraved by the body manufacturer. All switch legends shall have backlighting provided.

# SWITCHES LEFT PANEL

The left dash panel shall include four (4) switches. There shall be three (3) across the top of the panel with one (1) below. Two (2) of the top row of switches shall be rocker type and the left one (1) shall be the windshield wiper/washer control switch. The lower switch shall be a rocker type switch.

A rocker switch with a blank legend installed directly above shall be provided for any position not designated by a specific option. The non-designated switches shall be two-position, black switches with a green indicator light. Each blank switch legend can be custom engraved by the body manufacturer. All switch legends shall have backlighting provided.

# SWITCHES RIGHT PANEL

The right dash panel shall include no rocker switches or legends.

# SEAT BELT WARNING

A Weldon seat belt warning system, integrated with the Vehicle Data Recorder system, shall be installed for each seat within the cab. The system shall provide a visual warning indicator in the Vista display and control screen(s).

The warning system shall activate when any seat is occupied with a minimum of 60 pounds, the corresponding seat belt remains unfastened, and the park brake is released. The warning system shall also activate when any seat is occupied, the corresponding seat belt was fastened in an incorrect sequence, and the park brake is released. Once activated, the visual indicators and applicable audible alarm shall remain active until all occupied seats have the seat belts fastened.

# SEAT MATERIAL

The Bostrom Firefighter seats shall include a covering of extra high strength, tear resistant, and waterproof fabric made of durable Durawear Plus<sup>TM</sup> 1800 denier ballistic polyester. A PVC coating shall be bonded to the back side of the material to help protect the seats from UV rays and from being saturated or contaminated by fluids. Durawear Plus shall include low seam stitching to eliminate seam wear. Durawear Plus<sup>TM</sup> meets or exceeds specification of the common trade name Imperial 1800. The material meets FMVSS 302 flammability requirements.

Seats shall be Foam Block<sup>™</sup> encapsulated foam with Zip Clean covers. The encapsulated Foam Block<sup>™</sup> feature shall resist gas and liquid absorption in the cushion. Seat cushions, head rest and side bolsters shall zip off using a heavy duty skirted zipper to allow for quick removal and easy cleaning. All Zip off covers are designed for machine washing and air drying.

One (1) extra seat cushion and applicable back cover(s) shall be provided per seating position.

If applicable, Theatre style seats located in the cab shall be high strength, wear resistant fabric made of durable ballistic polyester. A PVC coating shall be bonded to the back side of the material to help protect the seats from UV rays and from being saturated or contaminated by fluids. Common trade names for this material are Imperial 1200 and Durawear.

# SEAT COLOR

All seats supplied with the chassis shall be gray in color. All seats shall include red seat belts.

# SEAT BACK LOGO

The seat back shall include the "Spartan" logo. The logo shall be centered on the standard headrest of the seat back and on the left side of a split headrest.

## SEAT DRIVER

The driver's seat shall be an H.O. Bostrom 500 Series Firefighter Sierra model seat. The seat shall feature eight-way electric positioning. The eight positions shall include up and down, fore and aft with 8.00 inches of travel, back angle adjustment and seat rake adjustment. The seat shall feature integral springs to isolate shock.

The seat shall feature an all belts to seat (ABTS) style of safety restraint. The ABTS feature shall include a threepoint shoulder harness with the lap belt, automatic retractor and buckle as an integral part of the seat assembly. The ABTS feature shall also include the RiteHite<sup>™</sup> shoulder adjustment feature to provide enhanced comfort and safety by allowing customized seat belt fit.

The minimum vertical dimension from the seat H-point to the ceiling for this belted seating position shall be 35.00 inches measured with the seat height adjusted to the lowest position of travel.

This model of seat shall have successfully completed the static load tests set forth by FMVSS 207, 209, and 210 in effect at the time of manufacture. This testing shall include a simultaneous forward load of 3000 pounds each on the lap and shoulder belts and twenty (20) times the weight through the center of gravity.

The materials used in construction of the seat shall also have successfully completed testing with regard to the flammability of materials used in the occupant compartments of motor vehicles as outlined in FMVSS 302, of which dictates the allowable burning rate of materials in the occupant compartments of motor vehicles.

### SEAT BACK DRIVER

The driver's seat shall include a standard seat back incorporating the all belts to seat feature (ABTS). The seat back shall feature a contoured head rest.

#### SEAT MOUNTING DRIVER

The driver's seat shall be installed in an ergonomic position in relation to the cab dash.

#### **OCCUPANT PROTECTION DRIVER**

The driver's position shall be equipped with the IMMI 4Front and RollTek<sup>™</sup> Systems which shall secure belted occupants and increase the survivable space within the cab. The 4Front and RollTek<sup>™</sup> Systems shall selectively deploy integrated systems to protect against injuries in qualifying frontal impact, and rollover events.

The Driver's seating area protection shall include:

- Drivers airbag **DAB** inflates a steering wheel airbag to protect the head and neck of the driver.
- Driver's knee airbag **DKAB** inflating knee bolster airbags to protect the knees.
- Integrated roll sensor **IRS** detects an imminent rollover, activates protective devices and records crash events.
- Integrated belt pretension **IBP** device for mechanical and/or electrical seats tightens the seat belt, securing driver in seat and positions driver for contact with seat integrated head cushion side roll airbag.
- Inflatable head cushion seat integrated side roll airbag **SRA** protects driver's head/neck and shields driver from dangerous surfaces.

# ADDITIONAL SEAT COVER DRIVER

One (1) set of additional seat cushion and seat back covers shall be provided for the driver's position. The seat back cover shall either be a single piece for non-SCBA backs or a set of covers for bolsters and head cushions around the SCBA backs, dependent on seat back style.

# SEAT OFFICER

The officer's seat shall be a H.O. Bostrom 500 Series Sierra seat model. The seat shall feature a tapered and padded seat, and cushion. The seat shall be mounted in a fixed position.

The seat shall feature an all belts to seat (ABTS) style of safety restraint. The ABTS feature shall include a threepoint shoulder harness with the lap belt and automatic retractor as an integral part of the seat assembly. The buckle portion of the seat belt shall extend from the seat base towards the driver position within easy reach of the occupant. The ABTS feature shall also include the RiteHite<sup>™</sup> shoulder adjustment feature to provide enhanced comfort and safety by allowing customized seat belt fit.

The minimum vertical dimension from the seat H-point to the ceiling for this belted seating position shall be 35.00 inches.

This model of seat shall have successfully completed the static load tests by FMVSS 207/210. This testing shall include a simultaneous forward load of 3000 pounds each on the lap and shoulder belts and twenty (20) times the weight through the center of gravity. This model of seat installed in the cab model, as specified, shall have successfully completed the dynamic sled testing using FMVSS 208 as a guide with the following accommodations. In order to reflect the larger size outfitted firefighters, the test dummy used shall be a 95th percentile hybrid III male weighing 225 pounds rather than the 50th percentile male dummy weighing 165 pounds as referenced in FMVSS 208. The model of seats shall also have successfully completed the flammability of materials used in the occupant compartments of motor vehicles as outlined in FMVSS 302, of which decides the burning rate of materials in the occupant compartments of motor vehicles.

# SEAT BACK OFFICER

The officer's seat back shall include an IMMI brand SmartDock® Gen 2 hands-free self-contained breathing apparatus (SCBA) holder. The hands-free holder shall meet NFPA 1901-03 9G dynamic requirements for cylinder restraint systems for use in crew compartments of emergency response vehicles. The bracket shall accommodate and secure most types of self-contained breathing apparatus cylinders.

The hands-free holder shall consist of a back plate, bottom cradle, non-marring top claws, and claw height adjustment knob. The height adjustment knob shall allow for easy adjustment of the claws to the SCBA. The hands-free holder's claws shall lock from inertial forces to prevent the SCBA from becoming a projectile in the event of a crash to meet the NFPA 1901-03 standard for SCBA retention. The SCBA holder shall offer single-motion insertion into the claws and hands-free release when the SCBA fitted seat occupant rises.

The seat back shall include a removable padded cover which shall be provided over the SCBA cavity.

# SEAT MOUNTING OFFICER

The officer's seat shall offer a special mounting position which is 2.00 inches rearward of the standard location offering increased leg room for the occupant.

# **OCCUPANT PROTECTION OFFICER**

The officer's position shall be equipped with the IMMI 4Front and RollTek<sup>TM</sup> Systems which shall secure belted occupants and increase the survivable space within the cab. The 4Front and RollTek<sup>TM</sup> Systems shall selectively deploy integrated systems to protect against injuries in qualifying frontal impact, and rollover events.

The Officer's seating area protection shall include:

- Officer's knee airbag **OKAB** inflating knee bolster airbags to protect the knees.
- Integrated roll sensor **IRS** detects an imminent rollover, activates protective devices and records crash events.
- Integrated belt pretension **IBP** device for mechanical and/or electrical seats tightens the seat belt, securing officer in seat and positioning officer for contact with seat integrated head cushion side roll airbag.
- Inflatable head cushion seat integrated side roll airbag **SRA** protects officer's head/neck and shields officer from dangerous surfaces.

# ADDITIONAL SEAT COVER OFFICER

One (1) set of additional seat cushion and seat back covers shall be provided for the officer's position. The seat back cover shall either be a single piece for non-SCBA backs or a set of covers for bolsters and head cushions around the SCBA backs, dependent on seat back style.

# POWER SEAT WIRING

The power seat or seats installed in the cab shall be wired directly to battery power.

# SEAT BELT ORIENTATION CREW

The crew position seat belts shall follow the standard orientation which extends from the outboard shoulder extending to the inboard hip.

# SEAT FORWARD FACING OUTER LOCATION

The crew area shall include two (2) forward facing outboard seats, which include one (1) located next to the outer wall of the cab on the left side of the cab and one (1) located next to the outer wall on the right side of the cab.

# SEAT CREW FORWARD FACING OUTER

The crew area shall include a seat in the forward facing outer position which shall be a H.O. Bostrom 500 Series Firefighter model seat. The seat shall feature a tapered and padded seat, and cushion. The seat shall be mounted in a fixed position. The seat and cushion shall be hinged and compact in design for additional room. The seat shall include a "Fold and Hold" feature so that the cushion shall remain in the seated position and simply touched to flip up.

The seat shall feature an all belts to seat (ABTS) style of safety restraint. The ABTS feature shall include a threepoint shoulder harness with the lap belt and automatic retractor as an integral part of the seat assembly. The buckle portion of the seat belt shall extend from the seat base towards the driver position within easy reach of the occupant. The ABTS feature shall also include the RiteHite<sup>™</sup> shoulder adjustment feature to provide enhanced comfort and safety by allowing customized seat belt fit.

The minimum vertical dimension from the seat H-point to the ceiling for each belted seating position shall be 35.00 inches.

This model of seat shall have successfully completed the static load tests by FMVSS 207/210. This testing shall include a simultaneous forward load of 3000 pounds each on the lap and shoulder belts and twenty (20) times the weight through the center of gravity. This model of seat installed in the cab model, as specified, shall have successfully completed the dynamic sled testing using FMVSS 208 as a guide with the following accommodations.

In order to reflect the larger size outfitted firefighters, the test dummy used shall be a 95th percentile hybrid III male weighing 225 pounds rather than the 50th percentile male dummy weighing 165 pounds as referenced in FMVSS 208. The model of seats shall also have successfully completed the flammability of materials used in the occupant compartments of motor vehicles as outlined in FMVSS 302, of which decides the burning rate of materials in the occupant compartments of motor vehicles.

# SEAT BACK FORWARD FACING OUTER

The crew area seat backs shall include an IMMI brand SmartDock® Gen 2 hands-free self-contained breathing apparatus (SCBA) holder. The hands-free holder shall meet NFPA 1901-03 9G dynamic requirements for cylinder restraint systems for use in crew compartments of emergency response vehicles. The bracket shall accommodate and secure most types of self-contained breathing apparatus cylinders.

The hands-free holder shall consist of a back plate, bottom cradle, non-marring top claws, and claw height adjustment knob. The height adjustment knob shall allow for easy adjustment of the claws to the SCBA. The hands-free holder's claws shall lock from inertial forces to prevent the SCBA from becoming a projectile in the event of a crash to meet the NFPA 1901-03 standard for SCBA retention. The SCBA holder shall offer single-motion insertion into the claws and hands-free release when the SCBA fitted seat occupant rises.

The seat back shall include a removable padded cover which shall be provided over the SCBA cavity.

# SEAT MOUNTING FORWARD FACING OUTER

The forward facing outer seat shall be mounted in the furthest outboard position facing the front of the cab.

# **OCCUPANT PROTECTION FFO**

The forward-facing outer seat position(s) shall be equipped with the RollTek<sup>™</sup> System which shall secure belted occupants and increase the survivable space within the cab. The RollTek<sup>™</sup> System shall deploy integrated systems to protect against injuries in rollover events.

The forward-facing outer seat position(s) protection shall include:

- Integrated roll sensor **IRS** detects an imminent rollover, activates protective devices and records crash events.
- Integrated belt pretension **IBP** device for flip-up (non-theatre) and fixed mechanical seats tightens the seat belt, securing occupant in seat and positioning occupant for contact with seat integrated head cushion side roll airbag.
- Inflatable head cushion seat integrated side roll airbag **SRA** protects occupant's head/neck and shields occupant from dangerous surfaces.

# ADDITIONAL SEAT COVER FFO

One (1) set of additional seat cushion and seat back covers shall be provided for each forward-facing outer position. The seat back cover shall either be a single piece for non-SCBA backs or a set of covers for bolsters and head cushions around the SCBA backs, dependent on seat back style in each position.

# SEAT FORWARD FACING CENTER LOCATION

The crew area shall include two (2) forward facing center crew seats with both located at the center of the rear wall.

# SEAT CREW FORWARD FACING CENTER

The forward facing center seat shall be a H.O. Bostrom 500 Series Firefighter model seat. The seat shall feature a tapered and padded seat, and cushion. The seat shall be mounted in a fixed position.

The seat shall feature an all belts to seat (ABTS) style of safety restraint. The ABTS feature shall include a threepoint shoulder harness with the lap belt and automatic retractor as an integral part of the seat assembly. The buckle portion of the seat belt shall extend from the seat base towards the driver position within easy reach of the occupant. The ABTS feature shall also include the RiteHite<sup>™</sup> shoulder adjustment feature to provide enhanced comfort and safety by allowing customized seat belt fit.

The minimum vertical dimension from the seat H-point to the ceiling for each belted seating position shall be 35.00 inches.

This model of seat shall have successfully completed the static load tests by FMVSS 207/210. This testing shall include a simultaneous forward load of 3000 pounds each on the lap and shoulder belts and twenty (20) times the weight through the center of gravity. This model of seat installed in the cab model, as specified, shall have successfully completed the dynamic sled testing using FMVSS 208 as a guide with the following accommodations. In order to reflect the larger size outfitted firefighters, the test dummy used shall be a 95th percentile hybrid III male weighing 225 pounds rather than the 50th percentile male dummy weighing 165 pounds as referenced in FMVSS 208. The model of seats shall also have successfully completed the flammability of materials used in the occupant compartments of motor vehicles as outlined in FMVSS 302, of which decides the burning rate of materials in the occupant compartments of motor vehicles.

# SEAT BACK FORWARD FACING CENTER

The crew area seat backs shall include an IMMI brand SmartDock® Gen 2 hands-free self-contained breathing apparatus (SCBA) holder. The hands-free holder shall meet NFPA 1901-03 9G dynamic requirements for cylinder restraint systems for use in crew compartments of emergency response vehicles. The bracket shall accommodate and secure most types of self-contained breathing apparatus cylinders.

The hands-free holder shall consist of a back plate, bottom cradle, non-marring top claws, and claw height adjustment knob. The height adjustment knob shall allow for easy adjustment of the claws to the SCBA. The hands-free holder's claws shall lock from inertial forces to prevent the SCBA from becoming a projectile in the event of a crash to meet the NFPA 1901-03 standard for SCBA retention. The SCBA holder shall offer single-motion insertion into the claws and hands-free release when the SCBA fitted seat occupant rises.

The seat back shall include a removable padded cover which shall be provided over the SCBA cavity.

# **OCCUPANT PROTECTION FFC**

The forward facing center seat positions shall be equipped with the RollTek<sup>™</sup> rollover occupant protection system which shall secure occupants, increase the survivable space within the cab and protect against head/neck injuries in the event of a rollover accident.

The system shall function using a microprocessor-controlled, solid-state sensing device which, when the system detects a side roll shall provide instantaneous occupant protection (less than 0.3 seconds from trigger to total deployment) by automatically initiating the following sequence:

- •
- The seat belt shall tighten around the occupant.
- System Components Shall Include:
- Integrated Roll Sensor **IRS** detects an imminent rollover, activates protective devices and records crash events.

- Integrated Belt Pretension **IBP** with flip-up (non theatre) and fixed mechanical seats tightens the seat belt around occupant, securing occupant in seat.
- Integrated Gas Pretension **IGP** with flip-up theatre style seats tightens the seat belt around occupant, securing occupant in seat.

# ADDITIONAL SEAT COVER FFC

One (1) set of additional seat cushion and seat back covers shall be provided for each forward-facing center position. The seat back cover shall either be a single piece for non-SCBA backs or a set of covers for bolsters and head cushions around the SCBA backs, dependent on seat back style in each position.

# SEAT FRAME FORWARD FACING

The forward facing center seating positions shall include a full width seat frame located and installed at the rear wall. The seat frame shall span the available space on the rear wall. The seat frame shall be 12.38 inches high X 22.00 inches deep. The seat frame shall be constructed of Marine Grade 5052-H32 0.19-inch-thick aluminum plate. The seat box shall be painted with the same color as the remaining interior.

# SEAT FRAME FORWARD FACING STORAGE ACCESS

The seat frame shall include a forward facing vent which shall allow air to flow through from the underseat climate control unit.

# SEAT MOUNTING FORWARD FACING CENTER

The forward facing center seats shall be installed facing the front of the cab.

# CAB FRONT UNDERSEAT STORAGE ACCESS

The left and right under seat storage areas shall have a solid aluminum hinged door with non-locking latch.

# SEAT COMPARTMENT DOOR FINISH

All underseat storage compartment access doors shall have a multi-tone silver gray texture finish.

# WINDSHIELD WIPER SYSTEM

The cab shall include a triple arm linkage wiper system which shall clear the windshield of water, ice and debris. There shall be two (2) windshield wipers; each shall be affixed to a radial arm. The wiper motor shall be activated by an intermittent wiper control located within easy reach of the driver's position. The windshield wipers shall be interlocked with the park brake allowing activation only when the park brake is released.

# ELECTRONIC WINDSHIELD FLUID LEVEL INDICATOR

The windshield washer fluid level shall be monitored electronically. When the washer fluid level becomes low the yellow "Check Message Center" indicator light on the instrument panel shall illuminate and the message center in the dual air pressure gauge shall display a "Check Washer Fluid Level" message.

# CAB DOOR HARDWARE

The cab entry doors shall be equipped with exterior pull handles, suitable for use while wearing firefighter gloves. The handles shall be made of a fiber reinforced plastic composite with a black matt finish.

The interior exit door handles shall be flush paddle type with a black finish, which are incorporated into the upper door panel.

All cab entry doors shall include locks which are keyed alike. The door locks shall be designed to prevent accidental lockout.

# DOOR LOCKS

Each cab entry door shall include a manually operated door lock. Each door lock may be actuated from the inside of the cab by means of a red knob located on the paddle handle of the respective door or by using a TriMark key from the exterior. The door locks are designed to prevent accidental lock out.

# DOOR LOCK LH EMS COMPARTMENT

The left hand side EMS compartment shall feature a manual door lock.

# DOOR LOCK RH EMS COMPARTMENT

The right hand side EMS compartment shall feature a manual door lock.

# DOOR LOCK LH REAR CAB COMPARTMENT

The left hand side rear compartment shall feature a manual door lock.

# DOOR LOCK RH REAR CAB COMPARTMENT

The right hand side rear compartment shall feature a manual door lock.

# **GRAB HANDLES**

The cab shall include one (1) 18.00-inch knurled, anti-slip, one-piece exterior assist handle behind each cab door. The grab handle shall be made of SAE 304 stainless steel and be 1.25-inch diameter to enable non-slip assistance with a gloved hand.

# GRAB HANDLES ACCESSORY

Each assist handle shall include a stainless-steel plate which saves the cab from scuffs through continued use of the handle.

# **REARVIEW MIRRORS**

Retrac Aerodynamic West Coast style single vision mirror heads model 613285 shall be provided and installed on each of the front cab doors.

The mirrors shall be mounted via 1.00-inch diameter tubular stainless-steel arms to provide a rigid mounting to reduce mirror vibration.

The mirrors shall measure 8.00 inches wide X 19.00 inches high and shall include an 8.00-inch convex mirrors with a stainless-steel back, model 980-4, installed below the flat glass to provide a wider field of vision. The flat mirrors shall be motorized with remote horizontal and vertical adjustment. The control switches shall be mounted within easy reach of the driver. The convex mirrors shall be manually adjustable. The flat mirror glass shall be heated for defrosting in severe cold weather conditions.

The mirror backs shall be constructed of vacuum formed chrome plated ABS plastic housings that are corrosion resistant and shall include an amber marker light. The mirrors shall be manufactured with the finest quality non-glare glass.
# **REARVIEW MIRROR HEAT SWITCH**

The heat for the rearview mirrors shall be controlled through a virtual button on the Vista display and control screen.

# TRIM ROOF

The entire cab roof shall include 3003-H22 bright aluminum embossed tread plate which is 0.08 inches thick. This plate shall be intended for reinforcement value and shall be the full width of the flat portion of the roof centered left to right.

The tread plate shall be held in place using stainless steel fasteners and shall be sealed with silver silicone caulk around the perimeter of the tread plate and at each mounting screw.

# CAB FENDER

Wheel well liners shall be integrated into cab design and include a bed liner undercoat to limit road splash and enable easier cleaning. Each outer fenderette shall be 3.50 inches wide made of SAE 304 polished stainless steel.

# MUD FLAPS FRONT

The front wheel wells shall have mud flaps installed on them. The mud flaps shall extend from the outer edge of the wheel well to provide additional protection from road spray.

#### **CAB EXTERIOR FRONT & SIDE EMBLEMS**

The cab shall include three (3) Spartan emblems. There shall be one (1) installed on the front air intake grille and two (2) for the exterior sides of the cab shipped loose with the chassis for installation by the body manufacturer.

#### **IGNITION**

A master battery system with a keyless start ignition system shall be provided. There shall be a three-position rocker switch with off, battery, and ignition positions as well as a stainless-steel etched engine start push-button. The engine start button shall include an illuminated LED halo ring. Both switches shall be mounted to the left of the steering wheel on the dash.

The engine start switch shall only operate when the master battery and ignition switch is in the "ignition" position.

# **BATTERY**

The single start electrical system shall include six (6) Interstate 31-XHD 1000 CCA batteries with a 210-minute reserve capacity and 4/0 welding type dual path starter cables per SAE J541.

# BATTERY TRAY

The batteries shall be installed within two (2) stainless steel battery trays located on the left side and right side of the chassis, securely bolted to the frame rails. The battery trays shall be coated with the same material as the frame.

The battery trays shall include drain holes in the bottom for sufficient drainage of water. A durable, non-conducting, interlocking mat made by Dri-Dek shall be installed in the bottom of the trays to allow for air flow and help prevent moisture build up. The batteries shall be held in place by non-conducting phenolic resin hold down boards.

# BATTERY BOX COVER

Each battery box shall include a stainless-steel cover which protects the top of the batteries. Each cover shall include flush latches which shall keep the cover secure as well as a black powder coated handle for convenience when opening.

# **BATTERY CABLE**

The starting system shall include cables which shall be protected by 275-degree F. minimum high temperature flame retardant loom, sealed at the ends with heat shrink and sealant.

# **BATTERY JUMPER STUD**

The starting system shall include battery jumper studs. These studs shall be located in the forward most portion of the driver's side lower step, 8.00 inches apart. The studs shall allow the vehicle to be jump started, charged, or the cab to be raised in an emergency in the event of battery failure. A label stating "12V Jumper Studs" will be provided above the battery jump studs.

# ALTERNATOR

The charging system shall include a 360-amp Niehoff 12-volt alternator. The alternator shall include an ignition excited external regulator.

#### STARTER MOTOR

The single start electrical system shall include a Delco brand starter motor.

#### **BATTERY CONDITIONER**

A Kussmaul Auto Charge 40 LPC battery conditioner shall be supplied. The battery conditioner shall provide a 40amp output for the chassis batteries and a 15-amp output circuit for accessory loads. The battery conditioner shall be mounted in the cab behind the driver's seat.

#### BATTERY CONDITIONER DISPLAY

A Kussmaul battery conditioner with bar graph display shall be integrated into the electrical inlet.

# CAB/CHASSIS ELECTRICAL OUTLET

The cab shall include two (2) NEMA 5-20R black nylon duplex 20-amp receptacles with clear weather proof covers. The receptacles shall be mounted, one (1) each behind the driver's and officer's seat. Each outlet shall include a wall plate in a box shaped housing. The receptacles shall be ground fault circuit interrupter (GFCI) outlets with two (2) poles, three (3) wire configuration rated for 125 volts.

#### AUXILIARY AIR COMPRESSOR

A Kussmaul Auto Pump 120V air compressor shall be supplied. The air compressor shall be installed under the dashboard on the right-hand side; forward of the officer's seating position. The air compressor shall be plumbed to the air brake system to maintain air pressure.

# ELECTRICAL INLET LOCATION

An electrical inlet shall be installed on the left hand side of the cab ahead of the front door.

#### ELECTRICAL INLET

A Kussmaul 20-amp super auto-eject electrical receptacle shall be supplied. It shall automatically eject the plug when the starter button is depressed.

A single item or an addition of multiple items must not exceed the rating of the electric inlet that it's connected to.

#### Amp Draw Reference List: Kussmaul 40 LPC Charger - 5 Amps Kussmaul 40/20 Charger - 8.5 Amps Kussmaul 80 LPC Charger - 13 Amps Kussmaul EV-40 - 6.2 Amps Blue Sea P12 7532 - 7.5 Amps Iota DLS-45/IQ4 - 11 Amps 1000W Engine Heater - 8.33 Amps 1500W Engine Heater - 12.5 Amps 120V Air Compressor - 4.2 Amps 120V Dometic HVAC - 15 Amps

# **ELECTRICAL INLET CONNECTION**

The electrical inlet shall be connected to the battery conditioner, air pump, and electrical outlet.

#### **ELECTRICAL INLET COLOR**

The electrical inlet connection shall include a red cover.

# **HEADLIGHTS**

The cab front shall include four (4) rectangular LED headlamps with separate high and low beams mounted in bright chrome bezels. Each lamp shall include a heating system that de-ices the headlight.

#### **HEADLIGHT LOCATION**

The headlights shall be located on the front fascia of the cab directly below the front warning lights.

#### FRONT TURN SIGNALS

The front fascia shall include two (2) Whelen model M6 4.00-inch X 6.00-inch amber LED turn signals which shall be installed in a chrome radius mount housing above and outboard of the front warning and head lamps.

#### SIDE TURN/MARKER LIGHTS

The sides of the cab shall include two (2) Tecniq S170 LED side marker lights which shall be provided just behind the front cab radius corners. The lights shall be amber with chrome bezels.

#### MARKER AND ICC LIGHTS

In accordance with FMVSS, there shall be five (5) Tecniq S170 LED cab marker lamps designating identification, center and clearance provided. These lights shall be installed on the face of the cab within full view of other vehicles from ground level. The lights shall be amber with chrome bezels.

# HEADLIGHT AND MARKER LIGHT ACTIVATION

The headlights and marker lights shall be controlled via a virtual button on the Vista display. There shall be a virtual dimmer control on the Vista display to adjust the brightness of the dash lights. The headlamps shall be equipped with the "Daytime Running" light feature, which shall illuminate the headlights when the ignition switch is in the "On" position and the parking brake is released.

# LIGHTBAR SWITCH

The light bar shall be controlled by a virtual button on the Vista display and control screen. This button shall be clearly labeled for identification.

# **INTERIOR OVERHEAD LIGHTS**

The cab shall include a LED dome lamp located over each door. The lights shall include push switches on each lamp to activate both the clear and red portions of the light individually.

#### **INTERIOR OVERHEAD LIGHTS ACTIVATION**

The clear portion of each lamp shall be activated by opening the respective door and via the multiplex display.

# AUXILIARY DOME LIGHT MID CREW

The cab shall include two (2) LED auxiliary dome lights on the headliner in the middle of the crew area inboard of the outer seating positions. The clear portion of each lamp shall be activated by opening any cab door and both the red and clear portion can be activated by individual push switches on each lamp.

#### **LIGHTBAR PROVISION**

There shall be four (4) light bars installed on the cab roof. The light bars shall be provided and installed by the chassis manufacturer. The light bar installation shall include mounting and wiring to a control switch on the cab dash.

#### CAB FRONT LIGHTBAR MODEL

The cab shall be provided with two (2) Whelen model F4NMINI light bars. Each light bar shall be 21.50 inches in length and feature eight (8) customizable pods.

See the light bar layout for specific details.

#### CAB SIDE LIGHTBAR

There shall be two (2) Whelen brand Mini Freedom IV lightbars mounted one (1) on the left and one (1) right side of the cab roof parallel to the side of the cab above the left and right rear doors. The lightbars shall be NFPA compliant, and shall feature four (4) red LED light modules per lightbar.

#### SIDE SCENE LIGHTS

The cab shall include two (2) Whelen M9 LED scene lights, one (1) each side which shall be surface mounted. The Whelen lights shall provide directional lighting from twenty-four (24) Super-LEDs and a clear gradient lens. The scene light shall have specialized TIR optics for ideal scene illumination.

#### SIDE SCENE LIGHT LOCATION

The scene lighting located on the left and right sides of the cab shall be mounted in the upper forward portion of the cab between the front and rear crew doors.

#### SIDE SCENE ACTIVATION

The scene lights shall be activated by two (2) virtual buttons on the Vista display and control screen(s), one (1) for each light, and by opening the respective side cab doors.

# **GROUND LIGHTS**

Each door shall include a Tecniq T44 LED ground light mounted to the underside of the cab step below each door. The lights shall include a polycarbonate lens, a housing which is vibration welded and LEDs which shall be shock mounted for extended life.

# **GROUND LIGHTS**

The ground lighting shall be activated when the parking brake is set, by the opening of the door on the respective cab side, and through a virtual button on the Vista display and control screen.

#### **UNDER BUMPER LIGHTS**

There shall be two (2) Tecniq E10 LED ground lights mounted under the bumper. The under bumper ground lighting shall be interlocked with the park brake.

# LOWER CAB STEP LIGHTS

The middle step located at each door shall include a Tecniq T44 LED light which shall activate with the opening of the respective door. The lights shall include a polycarbonate lens, a housing which is vibration welded and LEDs which shall be shock mounted for extended life.

#### **INTERMEDIATE STEP LIGHTS**

The intermediate step well area at the front doors shall include a TecNiq D06 LED light within a chrome housing. The front egress step lights shall provide visibility to the step well area for the first step exiting the vehicle. The Egress step lights shall activate with entry step lighting.

#### **INTERIOR UNDERDASH LIGHT**

The area under the dash shall include two (2) clear lights, one (1) under the left hand dash and one (1) under the right hand dash. The lights shall be activated by the opening of the respective side doors. If the truck is equipped with APS, the under dash light location will be outside of the APS airbag clear zone.

# MAP LIGHTS

A Sunnex SL9 LED swivel map light shall be provided. The light shall have a clear lens and a control switch on the base. The light shall be mounted on the overhead HVAC cover on the right hand side.

#### ENGINE COMPARTMENT LIGHT

There shall be a LED NFPA compliant light mounted under the engine tunnel for area work lighting on the engine. The light shall activate automatically when the cab is tilted.

#### DO NOT MOVE APPARATUS LIGHT

The front headliner of the cab shall include three (3) flashing Whelen OS Series LED lightheads, one (1) red LED and two (2) amber LED, clearly labeled "Do Not Move Apparatus". In addition to the flashing lights, an audible alarm shall be included which shall sound while either light is activated.

Each flashing light shall be approximately 1.50 inches long X 1.00 inches wide X 0.50 inches high and shall be located centered left to right for greatest visibility.

The lights shall be in line from left to right across the headliner. The light nearest the driver shall be red and interlocked for activation when a cab door is not firmly closed, and the parking brake is released. The additional amber lights shall be connected to a multiplex node with individual outputs, for activation to the apparatus provided by the OEM.

# MASTER WARNING SWITCH

A master switch shall be included, as a virtual button on the Vista display and control screen which shall be labeled "E Master" for identification. The button shall feature control over all devices wired through it. Any warning device switches left in the "ON" position when the master switch is activated shall automatically power up.

#### **INBOARD FRONT WARNING LIGHTS**

The cab front fascia shall include two (2) Whelen M6 Super LED front warning lights in the left and right inboard positions. The lights shall feature multiple flash patterns including steady burn for solid colors and multiple flash patterns for split colors. The lights shall be mounted to the front fascia of the cab within a chrome bezel

# **INBOARD FRONT WARNING LIGHTS COLOR**

The warning lights mounted on the cab front fascia in the inboard positions shall be red.

#### **OUTBOARD FRONT WARNING LIGHTS**

The cab front fascia shall include two (2) Whelen M6 Super LED front warning lights in the left and right outboard positions. The lights shall feature multiple flash patterns including steady burn for solid colors and multiple flash patterns for split colors. The lights shall be mounted to the front fascia of the cab within a chrome bezel.

#### **OUTBOARD FRONT WARNING LIGHTS COLOR**

The warning lights mounted on the cab front fascia in the outboard position shall be red.

#### FRONT WARNING SWITCH

The front warning lights shall be controlled through a virtual control on the Vista display and control screen. This switch shall be clearly labeled for identification.

#### **INTERSECTION WARNING LIGHTS**

The chassis shall include two (2) Whelen M6 series Super LED intersection warning lights, one (1) each side. The lights shall feature multiple flash patterns including steady burn.

#### **INTERSECTION WARNING LIGHTS COLOR**

The intersection lights shall be red.

#### **INTERSECTION WARNING LIGHTS LOCATION**

The intersection lights shall be mounted on the side of the cab on the front radius.

#### SIDE WARNING LIGHTS

The cab sides shall include two (2) Whelen M6 Super LED warning lights, one (1) on each side. The lights shall feature multiple flash patterns including steady burn for solid colors and multiple flash patterns for split colors. The lights shall be mounted to the sides of the cab within a chrome bezel.

#### SIDE WARNING LIGHTS COLOR

The warning lights located on the side of the cab shall be red.

# SIDE WARNING LIGHTS LOCATION

The warning lights on the side of the cab shall be mounted over the front wheel well forward from the center of the front axle.

# AUXILIARY SIDE WARNING LIGHTS

The cab side shall include an auxiliary set of Whelen series M6 4.00-inch-tall X 6.00-inch-wide Super LED warning lights, one (1) each side, which shall feature multiple flash patterns including steady burn.

#### **AUXILIARY SIDE WARNING LIGHTS COLOR**

The auxiliary warning lights located on the side of the cab shall be red.

# **AUXILIARY SIDE WARNING LIGHTS LOCATION**

The auxiliary warning lights on the side of the cab shall be mounted behind the rear crew door. The auxiliary warning lights shall be centered approximately 36.25 inches up from the bottom of the cab.

#### ADDITIONAL SIDE WARNING LIGHTS

The cab sides shall include an additional set of Whelen series M9 Super LED 7.00-inch-tall X 9.00-inch-wide warning lights, one (1) each side, which shall offer multiple flash patterns including steady burn. The lights shall be programmed to emit the "Double Flash 150 Left/Right" flash pattern.

#### ADDITIONAL SIDE WARNING LIGHTS COLOR

The additional warning lights located on the sides of the cab shall be red and clear with a clear lens.

#### ADDITIONAL SIDE WARNING LIGHTS LOCATION

The warning lights on the side of the cab shall be mounted behind the rear crew door in the highest position available.

#### SIDE AND INTERSECTION WARNING SWITCH

The side warning lights shall be controlled through a virtual button on the Vista display and control screen. This button shall be clearly labeled for identification.

# TRAFFIC CONTROL

There shall be one (1) GTT (Global Traffic Technologies) Opticom model 792H high priority traffic control optical emitter, mounted in the center on the front of the cab roof. There shall be an indicator light on the dash. The emitter shall be activated by the master warn switch and shall be deactivated when the parking brake is applied.

# **INTERIOR DOOR OPEN WARNING LIGHTS**

The interior of each door shall include one (1) red 4.00-inch diameter Truck-Lite LED warning light located on the door panel. Each light shall activate with a flashing pattern when the respective door is in the open position to serve as a warning to oncoming traffic.

Each door shall also include one (1) 15.87-inch-long X 0.73-inch-tall amber Weldon LED warning light. The light shall be located on the upper portion of the door frame to be visible when a person is standing in front of the door while entering or exiting the cab. Each light shall activate with a scrolling directional flash pattern which moves from inside to outside when the door is in the open position. This shall serve as an additional warning to oncoming traffic.

#### SIREN CONTROL HEAD

A Whelen 295HFS2 electronic siren control head with remote amplifier shall be provided and flush mounted in the switch panel with a location specific to the customer's needs. The siren shall feature 200-watt output, hands free mode and shall be in "standby" mode awaiting instruction. The siren shall offer radio broadcast, public address, wail, yelp, or piercer tones and hands-free operation which shall allow the operator to turn the siren on and off from the horn ring if a horn/siren selector switch option is also selected.

# STEERING WHEEL HORN BUTTON SELECTOR SWITCH

A virtual button on the Vista display and control screen shall be provided to allow control of either the electric horn or the air horn from the steering wheel horn button.

#### **AUDIBLE WARNING LH FOOT SWITCH**

A foot switch wired to actuate the mechanical siren(s) shall be supplied for installation in the front section of the cab for driver actuation.

#### MECHANICAL SIREN FOOT SWITCH LH

The mechanical siren foot switch shall be a Linemaster model 491-S.

#### MECHANICAL SIREN FOOT SWITCH LH LOCATION

The mechanical siren foot switch shall be located on the left hand side accessible to the driver between the steering column and the door.

#### MECHANICAL SIREN FOOT SWITCH LH POSITION

The mechanical siren foot switch shall be positioned outboard of any other foot switch, if applicable.

#### AUDIBLE WARNING LH FOOT SWITCH BRACKET

A 30.00-degree angled foot switch bracket, wide enough to accommodate (2) foot switches, shall be installed outboard of the steering column for specified driver accessible foot switch activations.

#### **AUDIBLE WARNING RH FOOT SWITCH**

Two (2) foot actuated switches shall be supplied for installation in the front section of the cab for officer actuation. One (1) switch shall be wired to actuate the air horn(s) and one (1) switch the mechanical siren(s).

#### AIR HORN FOOT SWITCH RH

The air horn foot switch shall be a Linemaster model 491-S.

#### AIR HORN FOOT SWITCH RH LOCATION

The air horn foot switch shall be temporarily tied up with a coiled wire drop at the firewall inboard for installation by the customer on the right hand side accessible to the officer.

#### MECHANICAL SIREN FOOT SWITCH RH

The mechanical siren foot switch shall be a Linemaster model 491-S.

# MECHANICAL SIREN FOOT SWITCH RH LOCATION

The mechanical siren foot switch shall be temporarily tied up with a coiled wire drop at the firewall inboard for installation by the customer on the right hand side accessible to the officer.

# **MECHANICAL SIREN BRAKE/AUXILIARY ACTIVATION**

A siren brake shall be provided on the Vista display and control screens.

#### MECHANICAL SIREN INTERLOCK

The siren shall only be active when master warning switch is on to prevent accidental engagement.

#### BACK-UP ALARM

A Preco-Matic model 1059 dual function, dual sound backup alarm shall be installed at the rear of the chassis with an auto-adjusting output level of 87 dB to 112 dB. The alarm shall automatically activate when the transmission is placed in reverse.

#### **INSTRUMENTATION**

An ergonomically designed instrument panel shall be provided. Each gauge shall be backlit with LED lamps. Stepper motor movements shall drive all gauges. The instrumentation system shall be multiplexed and shall receive ABS, engine, and transmission information over the J1939 data bus to reduce redundant sensors and wiring.

A twenty-eight (28) icon lightbar message center with integral LCD odometer/trip odometer shall be included. The odometer shall display up to 999,999.9 miles. The trip odometer shall display 9,999.9 miles. The LCD message center screen shall be capable of custom configuration by the users for displaying certain vehicle status and diagnostic functions.

The instrument panel shall contain the following gauges:

One (1) three-movement gauge displaying vehicle speed, fuel level, and Diesel Exhaust Fluid (DEF) level. The primary scale on the speedometer shall read from 0 to 100 MPH, and the secondary scale on the speedometer shall read from 0 to 160 KM/H. The scale on the fuel and DEF level gauges shall read from empty to full as a fraction of full tank capacity. Red indicator lights in the gauge and an audible alarm shall indicate low fuel or low DEF at 1/8<sup>th</sup> tank level.

One (1) three-movement gauge displaying engine RPM, and primary and secondary air system pressures shall be included. The scale on the tachometer shall read from 0 to 3000 RPM. The scale on the air pressure gauges shall read from 0 to 150 pounds per square inch (PSI) with a red line zone indicating critical levels of air pressure. Red indicator lights in the gauge and an audible alarm shall indicate low air pressure.

One (1) four-movement gauge displaying engine oil pressure, coolant temperature, voltmeter, and transmission temperature shall be included. The scale on the engine oil pressure gauge shall read from 0 to 100 pounds PSI with a red line zone indicating critical levels of oil pressure. A red indicator light in the gauge and audible alarm shall indicate low engine oil pressure. The scale on the coolant temperature gauge shall read from 100 to 250 degrees Fahrenheit (°F) with a red line zone indicating critical coolant temperatures. A red indicator light in the gauge and audible alarm shall indicate high coolant temperature. The scale on the voltmeter shall read from 9 to 18 volts with a red line zone indicating critical levels of battery voltage. A red indicator light in the gauge and an audible alarm shall indicate high or low system voltage. The low voltage alarm shall indicate when the system voltage has dropped below 11.8 volts for more than 120 seconds in accordance with the requirements of NFPA 1901. The scale on the transmission temperature gauge shall read from 100 to 300 degrees °F with a red line zone indicating critical temperatures. A red indicator light in the gauge and an audible alarm shall indicate a high transmission temperature.

The light bar portion of the message center shall include twenty-eight (28) LED backlit indicators. The lightbar shall be split with fourteen (14) indicators on each side of the LCD message screen. The lightbar shall contain the following indicators and produce the following audible alarms when supplied in conjunction with applicable configurations:

# **RED INDICATORS**

Stop Engine - indicates critical engine fault
Air Filter Restricted - indicates excessive engine air intake restriction
Park Brake - indicates parking brake is set
Seat Belt - indicates a seat is occupied and corresponding seat belt remains unfastened
Low Coolant - indicates critically low engine coolant
Cab Tilt Lock - indicates the cab tilt system locks are not engaged.

# **AMBER INDICATORS**

Malfunction Indicator Lamp (MIL) - indicates an engine emission control system fault Check Engine - indicates engine fault Check Transmission - indicates transmission fault Anti-Lock Brake System (ABS) - indicates anti-lock brake system fault High exhaust system temperature – indicates elevated exhaust temperatures Water in Fuel - indicates presence of water in fuel filter Wait to Start - indicates active engine air preheat cycle Windshield Washer Fluid – indicates washer fluid is low DPF restriction - indicates a restriction of the diesel particulate filter Regen Inhibit-indicates regeneration of the DPF has been inhibited by the operator Range Inhibit - indicates a transmission operation is prevented and requested shift request may not occur. SRS - indicates a problem in the supplemental restraint system Check Message - indicates a vehicle status or diagnostic message on the LCD display requiring attention.

#### **GREEN INDICATORS**

Left and Right turn signal indicators ATC - indicates low wheel traction for automatic traction control equipped vehicles, also indicates mud/snow mode is active for ATC system High Idle - indicates engine high idle is active. Cruise Control - indicates cruise control is enabled Auxiliary Brake - indicates secondary braking device is active

#### **BLUE INDICATORS**

High Beam indicator

#### AUDIBLE ALARMS

Air Filter Restriction Cab Tilt Lock Check Engine Check Transmission Open Door/Compartment High Coolant Temperature High or Low System Voltage High Transmission Temperature Low Air Pressure Low Coolant Level Low DEF Level Low Engine Oil Pressure Low Fuel Seatbelt Indicator Stop Engine Water in Fuel

Extended Left/Right Turn Signal On ABS System Fault

# BACKLIGHTING COLOR

The instrumentation gauges and the switch panel legends shall be backlit using blue LED backlighting.

# HOUR METER

Within the instrument panel, a Honeywell brand hour meter shall be installed which shall measure the amount of hours the PTO has been operated. The hour meter shall be wired to the left hand PTO.

#### AUXILIARY SPEEDOMETER

The dash shall include an auxiliary analog speedometer.

#### <u>RADIO</u>

A Jensen brand radio with weather band, AM/FM stereo receiver, rear RCA input pigtail connector, Bluetooth, satellite radio capability, and a covered front auxiliary mini stereo input with iPod ready front and rear USB inputs shall be installed in a customer specified location.

#### **RADIO LOCATION**

The radio shall be installed in the left hand overhead position above the driver.

#### AM/FM ANTENNA

A small antenna shall be located on the left hand side of the cab roof for AM/FM and weather band reception.

# RADIO SPEAKERS

There shall be two (2) speakers installed in the front portion of the cab recessed overhead, two (2) speakers installed in the mid cab area and two (2) speakers installed in the rear portion of the cab overhead. The speakers shall be provided for connection to the sound system.

The speakers located in the mid cab area shall be prewired and routed to behind the cab center dash for connection to a body builder installed radio.

#### RADIO CUTOFF

The radio shall cut-out with activation of a virtual button on the Vista control and display screen.

#### CAMERA LEFT HAND

One (1) Audiovox Voyager heavy duty rearview teardrop shaped chrome plated housing camera shall be mounted on the driver side of the cab below the windshield ahead of the front door at approximately the same level as the cab door handles. The camera display shall activate when the left side turn signal is activated.

#### CAMERA RIGHT HAND

One (1) Audiovox Voyager heavy duty rearview teardrop shaped chrome plated housing camera shall be mounted on the officer side of the cab below the windshield ahead of the front door at approximately the same level as the cab door handles. The camera display shall activate when the right side turn signal is activated.

# **CAMERA REAR**

One (1) Audiovox Voyager heavy duty box shaped HD camera shall be shipped loose for OEM installation in the body to afford the driver a clear view to the rear of the vehicle.

The camera system shall include a one-way communication device that shall be an integral part of the rear camera for the use of voice commands directly to the driver. The rear camera display shall activate when the vehicle's transmission is placed in reverse.

# CAMERA DISPLAY

The camera system shall be wired to two (2) Weldon Vista display located on the driver's and officer's side dash. The camera system display can be activated through the Vista display panels.

# **CAMERA SPEAKER**

The rear camera shall be wired to speaker(s) in the cab and shall audible to the driver and officer. There shall be a virtual button provided on the Vista display and control panel to deactivate the speaker(s).

# **COMMUNICATION ANTENNA**

An antenna base, for use with an NMO type antenna, shall be mounted on the right hand front corner of the cab roof so not to interfere with light bars or other roof mounted equipment installed by chassis builder. The antenna base shall be an Antenex model MABVT8 made for either a 0.38 inch or 0.75 inch receiving hole in the antenna and shall include 17.00 foot of RG58 A/U cable with no connector at the radio end of the cable. The antenna base design provides the most corrosion resistance and best power transfer available from a high temper all brass construction and gold plated contact design. The antenna base shall be chassis builder supplied.

#### **COMMUNICATION ANTENNA CABLE ROUTING**

The antenna cable shall be routed from the antenna base mounted on the roof to the area inside the center rocker switch console.

# **AUXILIARY COMMUNICATION ANTENNA**

An auxiliary antenna base, for use with an NMO type antenna, shall be installed on the cab. The antenna base shall be an Antenex model MABVT8 and shall include 17.00 foot of RG58 A/U cable with no connector at the radio end of the cable. The antenna shall be mounted on the left hand front corner of the cab roof so not to interfere with light bars or other roof mounted equipment installed by chassis builder. The antenna base shall be chassis builder supplied.

# AUXILIARY COMMUNICATION ANTENNA CABLE ROUTING

The auxiliary antenna cable shall be routed from the antenna base mounted on the roof to the area inside the center rocker switch console.

# ADDITIONAL COMMUNICATION ANTENNA

An additional antenna base, for use with and NMO type antenna, shall be installed on the cab. The antenna base shall be an Antenex model MABVT8 and shall include 17.00 foot of RG58 A/U cable with no connector at the radio end of the cable. The antenna base shall be mounted in the inboard position on the left hand front corner of the cab roof so not to interfere with light bars or other roof mounted equipment installed by chassis builder. The antenna base shall be chassis builder supplied.

# ADDITIONAL COMMUNICATION ANTENNA CABLE ROUTING

The additional antenna cable shall be routed from the antenna base mounted on the roof to the area inside the center rocker switch console.

# CAB EXTERIOR PROTECTION

The cab face shall have a removable plastic film installed over the painted surfaces to protect the paint finish during transport to the body manufacturer. The rear wall shall also include a removable plastic film installed on the exterior surface of the cab to protect the finish during transport.

#### FIRE EXTINGUISHER

A 2.50-pound D.O.T approved fire extinguisher with BC rating shall be shipped loose with the cab.

# ROAD SAFETY KIT

The cab and chassis shall include one (1) emergency road safety triangle kit.

#### DOOR KEYS

The cab and chassis shall include a total of four (4) door keys for the manual door locks.

#### WARRANTY

Purchaser shall receive a Custom Chassis Three (3) Years or 48,000 Miles limited warranty in accordance with, and subject to, warranty certificate RFW0103. The warranty certificate is incorporated by reference into this proposal, and included with this proposal or available upon request.

# CHASSIS OPERATION MANUAL

There shall be two (2) digital copies of the chassis operation manual provided with the chassis. The digital data shall include a parts list specific to the chassis model.

#### ENGINE AND TRANSMISSION OPERATION MANUALS

The following manuals specific to the engine and transmission models ordered will be included with the chassis in the ship loose items:

(1) Hard copy of the Engine Operation and Maintenance manual with digital copy

- (1) Digital copy of the Transmission Operator's manual
- (1) Digital copy of the Engine Owner's manual

# **ENGINE SERVICE MANUALS**

There shall be two (2) printed hard copy sets of Cummins engine service reference manuals which shall be provided with the chassis.

# TRANSMISSION SERVICE MANUALS

There shall be two (2) printed hard copy sets of Allison 4000 transmission service manuals included with the chassis.

# CAB/CHASSIS AS BUILT WIRING DIAGRAMS

The cab and chassis shall include two (2) digital copies of wiring schematics and option wiring diagrams. The cab and chassis shall include two (2) printed copies of wiring schematics and option wiring diagrams.

# AS BUILT AIR PLUMBING DIAGRAM

The cab and chassis shall include two (2) digital copies of the as built air plumbing system and option air plumbing diagrams.

#### PAINT CONFIRMATION

There shall be a paint confirmation letter sent to the body manufacturer with paint spray outs to confirm the cab primary paint color or primary and secondary paint color as specified by the paint options.

#### AS BUILT FUEL PLUMBING DIAGRAM

The cab and chassis shall include two (2) digital copies of the as built fuel system plumbing diagram.

#### AERIAL DEVICE SPECIFICATIONS

#### MANUALS

The aerial manufacturer shall provide the following manuals pertaining to the aerial device:

Two (2): Operators' manuals. Two (2): Parts manuals in a CD format. Two (2): Electrical and Hydraulic Diagrams in a CD format.

# WARNING/INFORMATION LABELS

Warning and information labels shall be provided in appropriate locations to alert the operator of potential hazards and operating instructions. All warning labels shall be in compliance with (NFPA) 1901, Standard for Automotive Fire Apparatus.

# AERIAL LADDER DEVICE DEMONSTRATION - (3) CONSECUTIVE DAYS

A factory trained and authorized instructor shall provide three (3) consecutive days of on-site classes after apparatus acceptance. Topics covered in the class shall include:

- General familiarization and demonstration of aerial device
- Aerial apparatus safety including a review of all safety devices, interlocks, and operational hazards
- Positioning and locating the vehicle for safe operations
- Chassis parking brakes and engagement of hydraulic system
- Deployment of stabilization devices and use of ground pads
- Operation of elevation, extension, and rotation of the aerial device
- Operation of waterway, nozzle, and other firefighting devices of aerial device
- Specific aerial device maintenance and service areas for operators

- Shutdown and return to service operations
- Operation of tip controls and platform controls if equipped

Classes shall consist of presentations as well as hands-on demonstration.

# WARRANTY - AERIAL DEVICE

Purchaser shall receive an Aerial Ladder Structure Twenty (20) Years or 100,000 Miles limited warranty in accordance with, and subject to, warranty certificate RFW0403. The warranty certificate is incorporated by reference into this proposal, and included with this proposal or available upon request.

#### WARRANTY - AERIAL DEVICE COMPONENTS

Purchaser shall receive a General Two (2) Years or 36,000 Miles limited warranty in accordance with, and subject to, warranty certificate RFW0002. The warranty certificate is incorporated by reference into this proposal, and included with this proposal or available upon request.

#### WARRANTY - TELESCOPIC WATERWAY ASSEMBLY

Purchaser shall receive an Aerial Waterway Ten (10) Years or 100,000 Miles limited warranty in accordance with, and subject to, warranty certificate RFW0810. The warranty certificate is incorporated by reference into this proposal, and included with this proposal or available upon request.

# TEMPORARY TRANSPORT PACKAGE

Temporary mud flaps and DOT lighting (Stop, Tail, Turn) shall be provided behind the rear axle on each side of the apparatus for transport to the body builder's location.

#### MAXIMUM OVERALL LENGTH REQUIREMENT

The apparatus specified shall be constructed with no restrictions to the maximum overall length.

# MAXIMUM OVERALL HEIGHT REQUIREMENT

The apparatus specified shall be constructed as detailed and shall NOT exceed a maximum overall height of 140 inches.

#### MAXIMUM WHEEL BASE REQUIREMENT

The apparatus specified shall be constructed as detailed and shall NOT exceed a maximum wheel base of 244 inches.

# 110 FOOT 750# TIP LOAD REAR MOUNT AERIAL LADDER SPECIFICATIONS

#### **GENERAL INFORMATION**

The aerial ladder assembly shall be a four (4) section telescoping steel ladder, with a pre-piped waterway, steel turntable, torque box and outriggers.

#### **INTENT OF AERIAL SPECIFICATIONS**

The intent of these specifications is to describe a telescoping elevating ladder of the true ladder type. It shall consist of four (4) steel ladder sections, a steel turntable, a tube torque box and four outriggers. The rated vertical height of

the unit shall be 110' and the rated horizontal reach shall be 99'.

It is the intent of the purchaser that the device must meet all the requirements of the National Fire Protection Association's (NFPA) 1901, Standard for Automotive Fire Apparatus. It is also the intent of the purchaser to secure a fire service proven piece of apparatus that shall be manufactured in the U.S.A.

It is not the intent of the purchaser to deviate from this requirement; therefore, ladders attached to booms, whether solid or lattice, or articulating arms shall not be considered as meeting these specifications or the intent of these specifications.

# DESIGN STANDARDS

The design criteria of the unit shall be to create a structure and system that emphasizes safety, product reliability, and ease of operation. These criteria are:

1. All structural load supporting elements of the aerial ladder that are made of a ductile material, shall have a design stress of not more than 50 % of the minimum yield strength of the material based on the combination of the rated capacity and the dead load. This 2:1 structural safety factor meets the American National Standards Institute (ANSI) and the current National Fire Protection Association (NFPA) 1901, Standard for Automotive Fire Apparatus, standard.

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

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

4. The hydraulic system shall be designed so that if a failure of any component or assembly within the system occurs, a single point failure of the entire system will not occur.

5. The aerial shall be capable of operating with a rated tip load of either of the two of the following conditions:

- A. Conditions of high wind of up to 50 mph.
- B. Conditions of icing, up to a coating of .25" over the entire aerial structure.

The manufacture shall state what wind and ice conditions their aerial device is capable of operating without reducing the rated tip load. NO EXCEPTION!

All of the design criteria must be supported by the following test data:

1. Strain gauge testing of the complete aerial device certified by a **Registered Professional Engineer**.

- 2. Analysis of deflection data taken while the aerial device was under test load.
- 3. Hydraulic component operating and burst strength testing.

#### MATERIAL STANDARD

All structural materials used in the aerial shall be certified by the mill of the manufactured material. Materials that are not certified shall not be acceptable.

# **GENERAL APPARATUS DESCRIPTION**

The unit shall be designed to conform fully to the "**Aerial or Quint Fire Apparatus**" requirements as stated in the (NFPA) 1901, Standard for Automotive Fire Apparatus, shall include the general requirements as stated in Chapter 4 for Aerial or Quint Apparatus.

#### AERIAL DEVICE MOUNTING

The elevating aerial device turntable shall be rear mounted thus providing the following vehicle benefits:

1. Improved mobility vs. mid-ship mounted units, due to shorter overall travel length and wheelbase.

2. Increased compartmentation, hose load and water capacity in body, resulting from the aerial being raised to clear the cab.

3. Shorter vehicle wheelbase.

4. Shorter overall length of vehicle.

#### HEIGHT AND REACH

The height of the unit shall be a minimum of **110'** as measured by (NFPA) 1901, Standard for Automotive Fire Apparatus, requirements, which requires the rated vertical height of an aerial ladder shall be measured in a vertical plane with the ladder at maximum elevation and extension from the outermost rung of the outermost fly section to the ground. The bidder will state the height of the unit as measured by (NFPA) 1901, Standard for Automotive Fire Apparatus, standards.

The horizontal reach of the unit shall be a minimum of **99'** as measured by (NFPA) 1901, Standard for Automotive Fire Apparatus, requirements, which states, "The rated horizontal reach of an aerial ladder shall be measured in a horizontal plane from the centerline of the turntable rotation to the outermost rung on the outermost fly section with the aerial ladder extended to its maximum horizontal reach." The bidder shall state the reach of the unit as measured by (NFPA) 1901, Standard for Automotive Fire Apparatus, standards.

#### WELDMENT FIXTURES

To ensure exact tolerances between parts and part interchangeability, all weldments shall be manufactured in fixtures. To further insure weld integrity in all weldments, all aerial device fixtures must be able to position the weldments in the number 1 flat welding position resulting in maximum weld penetration in the welded material for both the tack and final weld process of the aerial device.

# AERIAL PAINTING

Prior to any painting, all weldments such as the outrigger beams, torque box, turntable, and aerial ladder sections shall be shot blasted, cleaned and inspected to insure the removal of any surface imperfections and to insure superior paint adhesion to the metal.

The entire painting system shall utilize a single manufacturer's paint for compatibility between primers and finished coats. The paint shall be AkzoNobel, Sikkens brand, "Top Coat", applied throughout a multi-step process. All painting shall be done in atmosphere controlled spray booths. The weldments will be primed with a zinc corrosive inhibitor and an Epoxy Primer. All seams between adjoining pieces that are not continuously welded shall be caulked to inhibit corrosion.

Before assembly, in preparation for final painting, the aerial unit shall be thoroughly cleaned, conforming to good painting practices.

# AERIAL DEVICE PAINT

The aerial ladder sections, Turntable base, side plates and deck structure shall be painted the same color unless specified otherwise.

The finished paint color shall be FLNA 41876 (to match 2185) white.

# AERIAL APPARATUS CERTIFICATIONS (TYPE 1)

The aerial device shall be tested in compliance with the National Fire Protection Association's (NFPA) 1901, Standard for Automotive Fire Apparatus.

The following tests shall be conducted by personnel holding a Level II certification to detect defects and improperly secured components:

1. Magnetic particle inspection shall be conducted on all ferrous welds to assure the integrity of the weldments and also detect any flaws or weaknesses. These tests shall be performed prior to paint or assembly.

2. Ultrasonic inspection shall be used to detect any flaws in pins, bolts and other critical mounting components. The bolts shall be tested after they have been torqued to ensure the bolt was not damaged.

3. All extension/retraction cables shall be tested and certified by the cable vendor.

4. Functional tests, load tests, stability tests and visual structural examination shall be performed. These tests will determine any unusual deflection, vibration, or instability characteristic of the unit.

5. Hydraulic oil shall be sample tested prior to delivery.

6. A waterway system flow/pressure test shall be performed.

Upon completion of the preceding inspections, an independent third-party testing company shall issue a Type I Certificate of Inspection indicating that all specified standards have been satisfied.

# **TESTS**

The following test shall be conducted to the aerial device prior to delivery; all listed tests shall be witnessed and certified to ensure the device meets all current requirements of (NFPA) 1901, Standard for Automotive Fire Apparatus.

**1. 1-1/2:1 DYNAMIC STABILITY AND LIFT TEST** - A test of the apparatus shall be performed that the aerial device sections are so designed and powered to support a load representing 150% of the manufacturer's rated tip load capacity at maximum horizontal reach on level ground. Since this is a dynamic test, the load must be raised, lowered and rotated without evidence of instability.

**2. 1-1/3:1 DYNAMIC STABILITY AND LIFT TEST** - A test of the apparatus shall be performed that the tip and aerial device sections are so designed and powered to support a load representing 133% of the manufacturer's rated tip load capacity at maximum horizontal reach on a five (5) degree slope. Since this is a dynamic test, the load must be raised, lowered and rotated without evidence of instability.

**3. TIME TEST** - A test of the apparatus shall be performed to raise the ladder from a bedded position extended to full height and rotated through a 90 degree turn smoothly and without undue vibration in not over 120 seconds.

**4. WATER TOWER TEST #1** - A test of the apparatus shall be performed to test its ability to discharge 1000 gallons per minute parallel to the aerial device with the unit at full extension and zero degree elevation. The unit shall be capable of performing this test while loaded to its rated tip load capacity.

**5. WATER TOWER TEST #2** - A test of the apparatus shall be performed to test the ability to discharge 1000 gallons per minute, 90 degrees to the side of the aerial device with the unit at full extension, zero degree elevation. The unit shall be capable of performing this test while loaded to its rated tip load capacity.

Bidders must state their ability to comply with all of the above tests. Failure to do so shall be grounds for rejection of their bid.

# AERIAL ELECTRICAL SYSTEM

12VDC electrical power for the aerial device shall be drawn from the chassis electrical system and routed through major segregated circuits and into an electric collector ring assembly. The circuits shall provide power for the aerial device controls, indicators, and interlocks; other circuits shall power auxiliary equipment such as lights, intercom, etc.

The electric collector ring assembly shall provide power for electrical ground, aerial device control functions, 12and 120-volt systems. The collector rings shall be enclosed in a sealed, weatherproof housing to prevent corrosion.

All aerial device wiring shall be multi-conductor, copper 18 gauge (minimum), color-coded, with thermosetting cross-linked polyethylene insulation. All aerial device wiring shall be in pre-engineered harnesses with each circuit identified by number and color code. Harness connections shall be through locking, weatherproof, guided pin connectors.

# HYDRAULIC SYSTEM

The hydraulic system shall provide power in as efficient a manner as possible. The system shall use a piston type load sensing pump and shall be capable of operating under any rated load condition and aerial position at normal engine idle (slow idle) or governor controlled fast idle. The piston pump shall be capable of generating sufficient flows to allow multiple function operation without significant loss of speed.

The system shall not be dependent upon an auxiliary cooler to control system temperature.

The hydraulic oil reservoir shall be temporarily mounted for transport to the body builder's location.

# POWER TAKE OFF (PTO)

The apparatus chassis shall be equipped with a "Hot-Shift" power take-off (PTO) driven by the chassis transmission as described elsewhere within these specifications. The PTO shall be actuated by an electric switch located inside the cab. An indicator light shall be located in the cab to show when the PTO is engaged.

A master "Aerial Power" switch shall be provided for engagement of all aerial device hydraulic functions and 12volt power. The "Aerial Power" circuit shall only engage with the parking brake applied and the transmission in neutral or drive if the fire pump (if equipped) is engaged.

An indicator light shall be located in the cab to show when the "Aerial Power" circuit is energized. The emergency pump circuit shall be controlled separately.

# AERIAL PTO HOURMETER

An hour meter shall be installed in the chassis cab as described elsewhere within these specifications. The hour meter shall be wired to the PTO circuit to record hours of PTO operation for the aerial device. The hour meter shall aid in scheduling preventative maintenance as outlined in the operator's manual.

# **ENGINE HIGH IDLE ACTUATOR**

The high idle actuator shall be used to raise the engine RPM to a preset level for proper aerial operation. The high idle switches shall be located in the chassis cab, at the stabilizer control station and the aerial control station.

For the safety of personnel and equipment, the high idle system shall not activate unless the interlock systems have been applied, the chassis spring brake is set, and the transmission is in neutral.

# AERIAL HYD, PUMP

The aerial hydraulic pump shall be drive shaft driven directly from the chassis provided PTO.

The pump shall be "Thru Drive" in design to allow the generator hydraulic pump to be directly attached and powered by a single PTO output.

#### HYDRAULIC OIL RESERVOIR

A hydraulic oil reservoir shall be provided to supply the needs of the hydraulic system. The tank shall be constructed from 7-gauge steel with welded interior and exterior seams. The tank shall be properly sized to provide optimal cooling and operational efficiency for the entire aerial hydraulic system.

Gated suction and drain lines shall be provided between the oil reservoir and the primary hydraulic pump. The tank fill shall be provided with a strainer screen, vent cap and magnetic drain plug. There shall be a sight level gauge for checking fluid levels.

The tank shall be cleaned and free from all contaminants before adding any fluid.

# HYDRAULIC SYSTEM FILTRATION

Outgoing and return line filtration shall be provided. The pressure and return filters shall be easily accessible for maintenance.

Outgoing filtration shall be in the form of a pressure line filter installed between the hydraulic pump and entrance to any system components. The filter shall have an absolute rating of ten (10) microns. The pressure filter shall have a bypass circuit protected by a 50-psi check valve, which shall be installed around the pressure filter. The pressure line filter shall be required even if a suction line filter is provided in the reservoir due to the suction line filter's inability to trap contaminates entering the system.

A filter condition indicator shall be provided.

The return line flow shall be filtered by means of a return line filter. This filter shall have an absolute rating of ten (10) microns.

#### EMERGENCY HYDRAULIC PUMP SYSTEM

In the event of failure of the main hydraulic pump or vehicle engine, the unit shall be equipped with an emergency hydraulic pump.

The pump shall be plumbed into the hydraulic system and shall be electrically driven from the chassis batteries. The emergency pump shall be capable of limited functions of the ladder and outriggers to stow the unit. The pump shall be controlled from the right and left outrigger control stations with spring loaded momentary contact switches.

The emergency pump shall have a separate hydraulic oil supply line, attached directly to the hydraulic oil reservoir. A shutoff valve shall be provided and a check valve shall be incorporated on the pressure side of the pump.

# HYDRAULIC HOSE, TUBING AND FITTINGS

All hydraulic steel tubing, hydraulic rubber covered wire-braided hoses, and hydraulic fittings/adapters shall have a minimum burst pressure rating of four times the operating pressure. Hoses and tubing shall be properly sized to minimize heat buildup during extended periods of operation. Hoses and tubing shall be properly sized to minimize flow restrictions.

All hydraulic hose shall have a tube and cover constructed of Nitrile elastomers and shall have braided/spiral wire reinforcement capable of maintaining a 4:1 safety factor in all areas of the hydraulic system. The hose shall meet the appropriate SAE performance specifications: 100 R2 or 100R12.

# SUPPLEMENTAL AERIAL HOURMETER

An additional aerial hour meter shall be installed inside the turntable control console pedestal to record the actual hours that the aerial device is in motion. The hour meter shall aid in scheduling preventative maintenance as outlined in the operator's manual.

The hour meter shall be analog and require no switching to be turned "On" in order to read the display.

# **OUTRIGGER/AERIAL INTERLOCK**

The aerial hydraulic system shall include an interlock feature that will prevent the accidental operation of the outriggers during aerial operation. This interlock shall also prevent accidental operation of the aerial device prior to the outriggers being properly deployed.

In the event of electrical failure, the operator shall be able to override the hydraulic system to operate the aerial device or outriggers for continuous, uninterrupted operation. A 5,000-psi hydraulic oil pressure gauge shall be provided and installed at the override location to monitor the overall pressure of the hydraulic system.

# LIFT, EXTENSION AND ROTATION HYDRAULIC CONTROL VALVE

A three-function hydraulic proportional valve bank shall control ladder functions. The valve shall be located at the turntable with direct linkage controls.

# TORQUE BOX

A tube torque box sub-frame shall be provided to transfer all aerial loads and torque into the four (4) outriggers, thus preventing the loads from being transferred through the chassis.

The torque box shall include two (2) "H-Box" (outrigger housing) weldments, forming a single structural weldment for aerial load distribution among the outriggers.

The torque box shall be bolted to the chassis frame with .75" SAE grade 8 bolts.

# TORQUE BOX THERMAL ZINC SPRAY COATING

The entire exterior surface of the torque box shall be shot blasted and treated with a Thermal Sprayed Zinc coating to inhibit corrosion.

Included in this coating shall be all exterior areas of the torque box and open base weldment below the turntable bearing plate.

# THERMAL ZINC SPRAY TOP COAT PAINT FINISH

A top coat paint finish shall be applied.

The finished paint color shall be FLNA 41878 (to match 9000) black.

#### **OUTRIGGERS**

The apparatus shall be equipped with four (4) "H" style "out and down" outriggers. The extension of the horizontal outrigger beams shall provide a 14' outrigger stance.

Five (5) slide pads shall be provided for each outrigger beam assembly to provide smooth operation and to extend the life of the outrigger.

The front outriggers shall be mounted at the front of the body. This design shall provide proper stability and minimize front axle and suspension loads while the aerial device is in operation over the front of the apparatus. The rear outriggers shall be mounted underneath the chassis frame to allow more ground ladder storage above the frame.

For ease of maintenance, the outrigger extension cylinders shall be equipped with end connections, which do not require removal of body panels to remove pins or the extension cylinders. The outrigger jack cylinders shall be removable by unbolting the jack tower cap and lifting the cylinder out vertically.

#### **OUTRIGGER SYSTEM HYDRAULIC CONTROL VALVES**

A directional control valve that is designed for parallel hydraulic circuit operations shall control the outrigger cylinder system. This valve shall be modular in design so that individual sections can be replaced in the field, rather than complete valve assemblies, thus reducing maintenance costs. Each valve shall be equipped with a heavy-duty electric solenoid for electric control of the outrigger from the remote operator's station.

#### **OUTRIGGER CONTROLS**

Two (2) illuminated outrigger control stations shall be provided, one (1) on each side of the rear of the vehicle. For safety, ease of deployment and operational speed, the outrigger controls shall be of the electric over hydraulic proportional type with manual overrides immediately accessible.

The outrigger controls shall be enclosed in a recessed compartment to protect each control from damage or accidental movement. The controls shall be located such that the operator can see the outrigger he is operating. Body designs that block the view of the outriggers from the control station shall not be acceptable.

Each outrigger control function shall be operated independently, so that the vehicle may be set up in restricted areas or on uneven terrain.

Each outrigger control station shall incorporate the following:

-Outrigger beam and jack actuator controller -Outrigger/Jack deployed indicator light - Green LED -Fast idle switch -Emergency pump control switch -Warning decals

#### **OBSTRUCTION DETECTION & DISPLAY SYSTEM**

The O.D.D.S (Obstruction Detection & Display System) shall incorporate a sonic emitter and sensor on each outrigger to detect obstacles in the potential path of each outrigger as the apparatus approaches the fire scene for deployment.

# O.D.D.S DISPLAYED ON VISTA

When activated, a representation of each outrigger shall be provided on the Vista Display in the cab. If no obstructions are detected, the outriggers shall be shown in the extended position. If an obstruction is detected in the potential path of any outrigger, that outrigger will not be displayed.

An O.D.D.S enable switch shall be provided on the Vista Display.

#### EXTENSION CYLINDERS

Each extension cylinder shall have a 3.00" internal bore with a minimum 2.00" chrome plated cylinder rod.

The extension cylinders shall be fully enclosed within the outrigger beam, preventing them from being nicked or scored during operations on the fire ground.

# JACK CYLINDERS

Each jack cylinder shall have a 5.00" internal bore with a 3.50" chrome plated cylinder rod. The jack cylinders shall be equipped with integral (on the cylinder) holding valves, which shall hold the jack cylinder in either the stowed position or the deployed position should a hydraulic line be severed at any point within the hydraulic system.

To minimize side loading and subsequent seal failure of the vertical jack cylinder, a 1.62" wide load bearing UHMW wear band shall encircle the jack cylinder barrel, providing load distribution over a 360-degree plane. Designs which could allow load concentration on one side of the vertical jack cylinder shall not be acceptable.

In order to provide faster setup time for the aerial on the fire ground, and to eliminate the possibility of damage to the housing should the outriggers be retracted with the jack pins left in, designs that require the use of jack pins shall not be acceptable.

For ease of maintenance, the outer jack tube shall be designed so that the cylinder can be removed from the top. Designs that require the outrigger beams to be removed or the jack cylinder positioned over a pit for jack cylinder removal, shall not be acceptable.

#### **OUTRIGGER BEAM PAINT**

The finished paint color shall be FLNA 96908 (to match 33723) silver enamel.

# **OUTRIGGER PADS**

A permanently attached self-centering floating type 1/2" thick, 154 sq. inch steel pad shall be provided on each outrigger. The pad shall swivel and require no adjustment during outrigger set-up.

The outrigger pad shall be attached without the use of a bearing type swivel due to maintenance required on this design. Outrigger pads that pivot in only one plane shall not be acceptable due to their inability to distribute loading over the total pad surface on uneven terrain.

#### **AUXILIARY OUTRIGGER GROUND PADS**

Four (4) auxiliary outrigger ground pads shall be provided for additional load distribution. Each ground pad shall measure 2" x 24" x 24" (576 sq. in.) and shall be fabricated of Composite Plastic. Each ground pad shall be equipped with a handle for easy use. The auxiliary pads shall be stored in locations that are readily accessible.

# AERIAL/OUTRIGGER INTERLOCK SYSTEM

An interlock system shall be provided between the outriggers and aerial device that prevents the operation of the aerial until the operator places all jacks in the load-supporting configuration. All jacks shall be equipped with a ground force sensitive switch that closes only when the jack is firmly in contact with the ground.

Until all the switches close, electrical and hydraulic power shall not be transmitted to the turntable, hence preventing aerial operation. Green indicator lights shall be provided on the outrigger control panel to indicate that the outrigger foot is in firm contact with the ground and in a load supporting position.

#### **ROPE ANCHOR POINTS**

There shall be four (4) D-ring anchor points provided and installed, one (1) on each outrigger jack tower. The anchors shall be rated at 9,000 lbs. capacity.

#### **OUTRIGGER/STABILIZER DEPLOYMENT WARNING ALARM**

An audible warning device shall be provided to warn personnel in the vicinity of the apparatus that the outriggers/stabilizers are in motion.

Whenever an outrigger/stabilizer control handle is utilized, the device shall produce a pulsing tone, separate and distinctive from that of other audible warning systems provided on the apparatus. When the control handle is released to its neutral position, the signal shall cease.

The warning device shall automatically enable the dB level to be raised or lowered by measurements of the ambient noise level.

#### **OUTRIGGER LIGHTING AND REFLECTIVE STRIPING**

Each outrigger shall be equipped with the following light and reflective striping package:

# **OUTRIGGER REFLECTIVE STRIPING**

Retro-reflective material shall be provided and installed on both sides of the horizontal and vertical beams of the outriggers.

#### **OUTRIGGER LIGHTING**

There shall be an LED ground illumination light located at each outrigger or downrigger location to illuminate the footpad area.

A total of four (4) lights shall be provided.

The lights provided shall be TecNiq model T44 series, 4" round, 8 diode LED lights.

Truck Lite 7" round LED red flashing lights shall be provided as warning lights when the outrigger beams are extended.

Each stabilizer beam shall be equipped with a total of two (2) lights, one (1) facing forward and one (1) facing rearward. The lights shall be mounted inboard of vertical jack tubes.

Both the foot pad illumination lights and the flashing outrigger warning lights shall be activated by the aerial power switch.

# **OUTRIGGER WARNING LIGHT WIRING**

Wiring for an OEM provided and installed NFPA warning light shall be provided at each outrigger jack tower location.

# TURNTABLE/TURNTABLE DECK

The turntable shall be a fabricated steel weldment designed for the rotation and elevation of the ladder sections. It shall consist of the following:

A steel bearing plate and matching top plate shall be machined to insure proper fit to the rotation bearing. Manufactures that do not mill both bearing surfaces shall not be acceptable.

Embossed aluminum diamond plate deck shall cover the entire turntable frame, providing a walking surface.

An embossed aluminum diamond plate access step shall be mounted at heel of the ladder.

All handrails shall be a minimum of 42" high. For ease of grip, the handrail shall be manufactured from 1-1/4" O.D. knurled stainless steel material.

Turntables with the drive motor or breathing air bottles mounted in any walking areas (front or rear) of the turntable shall not be acceptable.

A full-size turntable deck shall be provided to maximize the safe work area around the control console and to allow unimpeded access to and from the aerial ladder and the ground.

# TURNTABLE ACCESS SAFETY CHAINS

The two (2) turntable handrail openings shall be equipped with safety chains at the rear of the turntable.

# CRADLE ALIGNMENT INDICATOR ARROWS

Stainless steel arrows shall be installed on the turntable surface in view of the operator when standing at the turntable control station. The arrows will assist the operator in indicating the alignment of the aerial ladder with the ladder travel cradle. The indicators shall be overlaid with red reflective material and suitably illuminated for nighttime operation. Indicators shall be shipped loose for OEM installation.

# AERIAL CONTROL STATION

There shall be an aerial control station located at the turntable. All elevation, extension and rotation operational controls shall operate from this position. These controls shall be arranged to permit the operator to regulate the speed of these operations within the safe limits as determined by the manufacturer. Load instruction plates shall be located at the control station to show the recommended safe load of the ladder. The control devices shall be clearly marked and suitably lighted.

# TURN TABLE CONTROL STATION

The control station shall be located on the left side of the turntable, as the operator is facing the tip of the nested aerial ladder (Driver's side of the apparatus), in order to provide increased visibility of the ladder tip while operating the controls. The pedestal shall be set forward, away from the operator, to provide additional foot room.

The pedestal shall be constructed from an aluminum framework with an aluminum diamond plate wrapper. Access to the electrical and hydraulic components mounted inside the console shall be provided by either hinged doors or removable access panels. A hinged cover shall be provided over the console to protect the panel and controls. The top of the console shall be angled to face the operator for ease of ladder operation.

The console and turntable working areas shall be illuminated for night operations, and shall have all controls and indicators clearly marked.

Controls and indicators provided shall include, but shall not be limited to;

Three (3) ladder function control levers.

A recessed, foot operated "Operator Presence" switch, which shall protect against accidental movement of the control handles.

Rung alignment indicator light for ladder climbing operations.

Cradle alignment indicator light on console.

Engine high idle control switch.

Outriggers Not Deployed Indicator Lights.

Intercom controls in console lid.

Backlit bubble type angle indicator on base section near console.

Illuminated load chart.

Tracking Light Switch.

Tip Light Switch.

Monitor/Nozzle Control Switches.

Monitor Stowed Indicator.

Flow minder Display (If Selected).

Hydraulic Oil Pressure Gauge

Any additional switches and/or displays required by other options described elsewhere within these specifications, as available space permits.

The control console lid shall be fabricated from 1/8" aluminum diamond plate.

# AIR HORN BUTTON

An air horn button shall be provided at the turntable control console.

# HYDRAULIC, ELECTRIC AND WATER SWIVEL

Hydraulic power to the turntable hydraulic circuits shall be provided through a three-port, high pressure hydraulic swivel permitting 360 degrees continuous rotation of the turntable.

Water shall be transferred to the aerial waterway by means of a 4" internal diameter water swivel, permitting 360-degree continuous rotation.

Electric power to the turntable electric circuits shall be comprised of a minimum of twenty-two (22) ring collector assembly, permitting 360-degree continuous rotation of the turntable.

# **ELEVATION SYSTEM**

Two (2) double-acting lift cylinders shall provide smooth, precise elevation from 7 degrees below horizontal to 78 degrees above horizontal. Units that do not operate below minus 6 degrees shall not be acceptable.

The lift cylinders shall have a 6" internal diameter, 3-1/2" diameter cylinder rod and a 36-1/8" stroke. Integral cylinder holding valves shall be provided to prevent the unit from lowering should the charge lines be severed at any point within the hydraulic system. Units that do not use holding valves on the cylinders shall not be acceptable. A hydraulic holding valve shall be provided in the elevation circuit to retain the aerial ladder in its bed when the vehicle is in motion.

The elevation cylinders shall be provided with both rod and piston "hydraulic cushions". The cushions shall serve to decelerate the cylinder near the end of its stroke resulting in a smooth stop at full cylinder stroke.

# AERIAL INTERLOCK SYSTEM

A limit switch at the aerial travel support shall be provided to prevent operation of the outriggers/stabilizers once the aerial device has been elevated from the nested position.

#### EXTENSION/RETRACTION SYSTEM

A full hydraulic powered extension and retraction system of the ladder shall be provided through dual hydraulic cylinders and cables, each capable of operating the ladder in the event of failure of one of the systems.

The extension/retraction cylinders shall be equipped with integral (on the cylinder) holding valves to prevent the unit from falling should the charge lines be severed any point within the hydraulic system.

The extension cylinders shall be provided with both rod and piston "hydraulic cushions." The cushions shall serve to decelerate the cylinder near the end of its stroke resulting in a smooth stop at full cylinder stroke.

Cylinders in excess of 25 feet with the rod extended, or that require the attachment of the rod to the mid-section, shall not be desirable for two (2) reasons that are not consistent with the level of quality desired by the purchaser:

- Rod attachment to the mid-section requires that the lower rung rail cannot be sealed from the atmosphere and therefore long-term corrosion cannot be adequately controlled.
- The cylinder shall be subjected to the buckling forces caused by normal ladder deflection.

Cables attached to the base and mid ladder sections shall be routed over sheave wheels on the base section and cylinder barrel. This cabling arrangement shall act as a stroke multiplier to provide full-power ladder extension and retraction. Extension of the ladder sections shall be accomplished by the movement of the cylinder barrel toward the turntable end of the base section, thus providing better weight distribution when the ladder is extended.

Retraction of the ladder sections shall be accomplished by movement of the barrel toward the outboard end of the base section, thus providing better weight distribution between front and rear axles of the apparatus when stowed in the travel position.

The extension/retraction cables shall have a minimum safety factor of 5:1 and shall be of the following diameters:

- Inner Mid-Section: 9/16"
- Outer Mid-Section: 3/8"
- Fly Section: 1/4".

# EXTENSION INDICATORS

Reflective numerals shall be affixed to the inside of the handrail of the base section opposite the turntable control console. The numerals shall be at appropriate intervals indicating total aerial extension in 10-foot increments. A band on the first fly section shall align with these marks at the appropriate extension distance. An additional stripe shall be provided between the numbered stripes to indicate each 5 feet of aerial extension.

The extension indicator color shall provide a high contrast with the color of the ladder section to which it is applied.

This shall make the length of aerial extension easily readable by the operator by merely glancing at the indicators.

The extension markers shall be provided in red reflective material.

# LADDER SLIDE MECHANISM

UHMW slide pads shall be provided on each ladder section for load transfer between sections. Slide pads shall be used on both upper and lower bearing surfaces and to control side sway of the sections.

The pads shall utilize low coefficient of friction materials to reduce the resistance between the pads and ladder sections. The ladder rails shall be sprayed with a rust prohibitive paint designed to ride on a set of pads which require no greasing of the rails.

In order to maintain a high "in service" level of operation, the ladder shall be designed to require minimum amounts of lubrication.

#### AIR/ELECTRIC LADDER TRACK

All air and electric line routing from the turntable to the tip of the aerial device shall be accomplished using a flexible conduit system. Routing shall be such that cables shall be fully enclosed except at points of transition between sections.

The conduit shall run along the handrail uprights, between the ladder sections, so the conduit does not decrease the interior width of the ladder.

#### **ROTATION SYSTEM**

An external tooth monorace bearing shall be provided for 360-degree continuous rotation in either direction. To ensure proper bearing installation and long service life, surfaces of both the open base bearing plate and the turntable bearing plate shall be milled. Units that do not have milled bearing surfaces shall not be acceptable.

The bearing shall be bolted to the turntable and bolted to the open base support plate, using 7/8" diameter Grade 8 bolts. A planetary drive, powered by a hydraulic motor, shall provide precision rotation control throughout 360 degrees of rotation. A spring-applied, hydraulically-released disc type brake shall be furnished to provide positive braking of the turntable assembly against reactionary forces such as water flow and gravity.

The turntable rotation bearing shall be easily accessible for lubrication and retorquing of bolts from the turntable side, for ease of access.

Access to the turntable bearing bolts which requires the removal of the ground ladders and/or the ground ladder slide assemblies, during bolt retorquing process, shall not be acceptable.

# **ROTATION SAFETY SYSTEM**

The Rotation Safety System shall be designed to prevent the operator who has primary operational responsibility from rotating the aerial device into an overturning mode. This system senses outrigger and outrigger jack positioning in conjunction with the aerial device movement. Indicator lights shall be provided on the turntable control console to indicate outrigger not fully deployed status.

If the aerial device operator attempts to rotate the aerial device (in excess of approximately 5 degrees beyond vehicle center) towards the side of the vehicle in which the outriggers are not fully deployed, the Rotation Safety System shall sense this fault and prevent the aerial from rotating further in said direction. At this point, only rotation to the fully deployed outrigger side shall be allowed.

#### **COLLISION PROTECTION INTERLOCK**

The apparatus shall be equipped with a cab collision protection interlock. This interlock shall be enabled while rotating the aerial device at elevations as low as, or lower than the cab of the apparatus.

Should the operator accidentally rotate the aerial device toward the cab at an elevation low enough to cause a collision with the cab, the interlock shall automatically stop rotation of the aerial at a point that is within a few degrees of the cab.

A manual override shall be provided to override the interlock system.

#### APPARATUS BODY DAMAGE CONTROL INTERLOCK SYSTEM

A safety feature shall be included in the aerial operational system that minimizes the possibility of damage to the apparatus body at all angles for all standard (non-override) operational modes.

The system shall automatically stop the downward movement of the aerial at a preset angle of elevation unless the aerial has been rotated at least 80-degrees, left or right, from the center of the ladder support. Once this rotation point is reached, full range downward movement (to -8 degrees) shall be allowed.

The aerial manufacturer shall determine and set the angle of elevation where downward aerial movement is stopped. The highest point of an apparatus, in relation to the distance from the turntable, shall be used to determine the preset elevation angle stopping point.

The system shall also minimize the possibility of accidental damage to the apparatus body from aerial rotation whenever the aerial elevation is below the preset elevation angle stopping point.

Rotational speed shall be reduced and Aerial rotation shall automatically stop before the aerial contacts the body of the apparatus.

The body damage interlock system shall have no effect on aerial operation when the aerial is raised above the preset downward movement stopping point.

The body damage interlock system shall not eliminate the possibility of damage to components such as telescopic lights that are in a raised position.

A manual override shall be provided that will override the interlock system.

# HEAVY DUTY LADDER TRAVEL SUPPORT

A heavy duty ladder rest shall be provided for support of the ladder in the travel position. The ladder rest shall be attached to the chassis frame rails immediately rearward of the cab. The travel support shall be fabricated from heavy duty steel tubing and shall be designed to be easily removable to allow for ease of maintenance and repair if necessary.

The base section of the ladder shall contain stainless steel scuff plates where the ladder comes into contact with the ladder support. The travel rest shall be painted to match the torque box unless otherwise specified on the paint form.

An indicator light shall be provided on the turntable to indicate when the ladder is aligned with the travel support and may be lowered into it.

# AERIAL LADDER SECTION CONSTRUCTION

The aerial ladder shall be comprised of four (4) sections. The ladder section design objective shall complement the support of heavy or uneven aerial loads at low angles of elevation, or at full extension. Each ladder section shall be fabricated in fixtures assuring uniformity, replace ability, or changeability, and shall be welded in accordance with American Welding Standards (AWS) criteria by certified welders.

The ladder sections shall be constructed of welded high-strength steel throughout. Each section shall be trussed diagonally, vertically, and horizontally, using steel rectangular tubing, reinforced at critical points for extra rigidity, thus giving a high strength-to-weight ratio. Each section shall be equipped with 1-1/4" diameter rungs, placed at no greater than 14-inch centers for ease of climbing.

To assure the level of quality desired, each ladder section shall include the following:

1. Base Section - All rails, including the lower rail, shall be sealed from the atmosphere. The base ladder section shall include a triangulated lifting configuration. This arrangement shall consist of front and rear cross tubes, forward triangle tube, rear triangle tube, lift cylinder outboard support tube and steel plating welded into place where the lifting cylinders attach to the aerial ladder base section.

2. Mid-Section, Outer Mid-Section and Fly Section - All rails, including the lower rung rail, shall be sealed as described for the base section.

All ladder rungs shall be welded to each rung rail section in two (2) places. K-bracing shall be provided between the rungs and the ladder rung rails to provide the ability to discharge water at 90 degrees to the side of the ladder.

All rungs shall be round with rung covers installed to provide a slip resistant stepping surface.

# RUNG COVERS

Each rung shall be equipped with a heavy duty serrated, replaceable rung cover to provide an anti-slip surface for firefighting personnel. For additional safety, the covers shall be constructed from rubber to allow ice buildup to easily break off when the rung is stepped on. These covers shall be both glued and clamped securely to the rungs with metal clips.

Due to high maintenance cost and difficulty in replacement of anti-slip rung surface and the inability to provide a safe surface during icing conditions, ladder designs that do not utilize rubber rung covers shall not be acceptable.

# LADDER SECTION DIMENSIONS

All bidders shall state in the space provided below their dimensions on the unit proposed. Dimensions proposed must equal or exceed these specified. All Dimensions are from top of rung to top of handrail. All width dimensions are inside to inside of handrails.

Handrail	Height	Width
Base Section	24.00"	36.25"
Inner Mid	21.75''	31.00"
Outer Mid	20.00"	25.75''
Fly	18.125" 21.75"	
OVERLAP SURFACES BETWEEN SECTIONS		
Base to Inner Mid Fly Section		90.00''
Inner Mid Fly to Outer Mid-Section		90.00''
Outer Mid Fly to Fly Section		90.00''

# LADDER EGRESS

A removable bolt on stainless steel egress shall be installed on the tip of the fly section. Only certified structural fasteners shall be utilized to attach the egress to the tip of the fly section. Additionally, the fasteners shall be stainless steel. This design shall allow for easy replacement should the egress become damaged during rescue operations. This shall prevent the department from experiencing serious downtime, as is common with welded on egresses. For this reason, a design that allows the egress to be welded to the fly section shall not be acceptable.

The egress shall have knurled handrails with an extended radius design at the tip to eliminate corner joints, and increase strength. The straight design of the egress will allow the aerial waterway monitor/nozzle to be placed up to 30 degrees above horizontal centerline for additional range of water stream operation.

The rungs on the egress shall be held to the same design load criteria as the rungs of the aerial ladder sections. This mean that each egress rung shall be able to support the tip load rating of the aerial device, distributed across the rung as specified in NFPA 1901. This shall be in excess of that required by the aforementioned standard.

The egress shall be provided with a Powder Coated finish.

The finished color shall be **Hi Viz Orange** 

# FLY SECTION FOLDING STEPS

Two (2) spring-loaded aluminum folding steps with non-slip aluminum grating inserts shall be installed in the fly section of the aerial to provide footing for an operator stationed at the tip of the fly section. Springs shall hold the steps in place during use and secure the steps in the stowed position when not in use. Each step shall have a surface area of 72 square inches and a minimum design load of 500 lbs. A folding Toe "Kick Plate" shall be provided at the forward edge of each step surface.

# AERIAL WATER SYSTEM

The aerial waterway system shall be capable of being supplied by an external water source with the inlet on the rear of the apparatus.

All piping from the inlet at the rear of the apparatus to the riser pipe below the turntable swivel shall be 4" Schedule 40 aluminum 6061 T6 pipe. Piping at the rear of the torque box shall terminate with a Victaulic groove for installation of OEM provided and installed rear inlet piping/termination fittings.

A 4" water swivel shall be located in the riser pipe permitting 360-degree continuous rotation of the aerial device.

A 4" heel pin swivel connection between the aerial device waterway and the turntable swivel permitting water tower operations thru full aerial elevation range shall be provided.

A 2-1/2" adjustable relief valve shall be located beneath the turntable to protect the water system from excessive pressures.

The plumbing shall include a drain valve system provided and installed by the body builder to drain the aerial device water system.

# TELESCOPIC WATERWAY

An anodized aluminum telescopic waterway shall be mounted beneath the center of the aerial ladder. The waterway shall have a 5" base section tube, 4-1/2" lower mid-section tube, 4" upper mid-section tube and a 3-1/2" fly section tube.

#### WATER SYSTEM FRICTION LOSS

As per NFPA, the friction loss (total system loss less head loss) shall not exceed 100 psi at 1000 GPM flow with the aerial device at full horizontal extension. The pressure reading for friction loss measurement shall be taken at the base of the monitor and at a point below the waterway swivel.

# AERIAL WATERWAY FLOWMETER

The apparatus shall be equipped with a Class 1 Flowminder, model #FMS at the aerial discharge waterway to give the aerial operator an indication of actual volume of water (in gallons per minute) being discharged through the line. Display shall be located at the aerial operator's control console.

Flowminder system shall consist of:

1. A digital display shall be wired to the flow transmitter to show waterway discharge flow.

2. A flow transmitter mounted in the discharge line piping between the pump/inlet and the discharge outlet. The transmitter shall consist of a weather resistant black composite housing with a stainless steel, durable paddle wheel. The only part inserted into the water flow path shall be the paddle wheel.

The flowmeter shall be checked and calibrated prior to delivery of the apparatus.

# **MOVABLE MONITOR FEATURE**

The aerial ladder waterway monitor shall be capable of being positioned at either the fly section for water tower operation or at the next lower ladder section for rescue. The aerial ladder shall be capable of full extension and operation when the waterway is connected to either section of the ladder.

The waterway and monitor shall have a positive lever type latching system to secure them either to the tip of the fly section or next lower section of the aerial ladder. A latching system requiring a pin to be removed from one location and repositioned into another location shall not be acceptable due to the possibility of dropping the latching pin.

The monitor shall be remotely operable from either position and shall transfer the electrical power and controls automatically. When operated from the rescue position (mid-section), the vertical range of motion of the monitor shall be limited to 0 degrees (horizontal center line of the aerial ladder).

Due to problems associated with aligning electrical connectors used to transfer power between rescue and water tower positions, the power transfer shall be achieved by a cable carrier system.

#### AERIAL WATER SYSTEM

A minimum 4" water swivel shall connect from the aerial waterway supply piping to the telescopic aerial waterway. The water swivel shall permit full operation at any elevation of the aerial device. The aerial waterway pipes shall be designed to reduce friction loss in the waterway.

All aerial waterway piping shall be completely removable for service or replacement. Aerial designs in which the waterway is welded or utilized for structural integrity of the aerial shall not be acceptable.

# ELECTRICALLY CONTROLLED MONITOR

An Akron Brass, model 3480 StreamMaster II, 2000 gpm electric monitor, constructed of lightweight Pyrolite, shall be installed on the outer end of the telescoping aerial waterway. The monitor relay box shall be located on at the tip of the aerial device, adjacent to the monitor, and will be easily accessible for service.

The monitor and nozzle functions shall be controlled from the tip of the fly section through hard wired connections and wirelessly from each of the aerial control station(s) specified. The monitor and nozzle controls at the tip and optional control stations shall consist of three (3) individual spring loaded, self-centering, and weather resistant toggle switches.

The monitor shall be capable of a vertical sweep of 165 degrees, and a horizontal sweep of 180 degrees (90 degrees to each side of the aerial center line).

**NOTE**: Monitor operation above 0 degrees (horizontal center line of the aerial ladder) reduces payload capacity by 250 lbs.

A guarded, momentary "Monitor Stow" switch shall be provided and installed on the turntable control console.

# NOZZLE

An Akron Brass, model 5177, Akromatic 1250 electric combination fog and straight stream nozzle with automatic flow mechanism that provides a flow range of up to 1250 gpm at 80 psi shall be provided. The nozzle shall be constructed of durable, lightweight Pyrolite and shall have electric pattern selection from straight stream to wide fog controlled by a 12V motor and linear ball screw, a manual override pattern control knob, and a built-in stream shaper.

# LADDER TIP MOUNTED STACK TIPS

One (1) set of stack tips shall be installed at the tip of the aerial ladder.

# AKRON # 3499 TRIPLE STACKED TIPS

One (1) Akron #3499 Pyrolite, triple stacked tip set shall be provided with the aerial device. Tip set shall be provided with a 3-1/2" base with 2-1/4", 2-1/2" & 2-3/4" orifices. An Akron #350 screw type mounting plate shall be installed to hold the tips when not in use.

#### LADDER TIP MOUNTED SHAPER TUBE

One (1) shaper tube shall be installed at the aerial ladder tip.

#### AKRON # 3485 SHAPER TUBE

One (1) Akron #3485, extruded aluminum "Stream Shaper" shall be provided with the aerial device. The shaper tube shall be provided with a 3-1/2" inlet, 3-1/2" outlet and shall be 4" long. A screw type mounting plate shall be installed to hold the shaper tube when not in use.

# LADDER CAPACITIES

The following ladder tip load capacities shall be established with the truck level; the outriggers fully extended and lowered to relieve the chassis weight from the axles. All capacities are based upon full extension and 360 degree rotation.

#### AERIAL CRITERIA AND STANDARDS

The following aerial ladder and water capabilities shall be established in the unsupported configuration with the truck level, the outriggers fully extended and lowered to relieve the chassis weight from the suspension. The capacities shall be based upon 360 degree continuous rotation and up to full extension. The ratings shall be based on average weight of personnel on ladder 250 lbs. each.

#### **LADDER OPERATIONS**

The ladder shall be designed to permit a 750 pound tip load, up to full ladder extension from -7 to 78 degree elevation.

# WATER TOWER OPERATION

The ladder and water system shall be designed to permit 1500 GPM flow with water stream parallel to ladder or 90 degrees to either side of the ladder. The stream elevation shall be from 0 degrees above horizontal to 135 degrees below horizontal.

With the above flow rating, the ladder shall be capable of -7 to 78 degree elevation at full extension with a 500 pound tip load.

**Note:** Monitor operation above 0 degrees (horizontal center line of the aerial ladder) reduces payload capacity by 250 lbs.

#### **OPERATIONS ON GRADES**

The aerial unit shall be capable of operating with 100% of rated capacity on a slope of up to 10.5 degrees. Operating capacity shall be reduced to 50 % capacity for operating on a slope of 10.6 degrees to 15 degrees. Operation beyond a 10.5-degree slope shall be at operator's discretion. Devices that cannot provide this leveling capability are not acceptable.

# **COMMUNICATION SYSTEM**

An Atkinson Dynamics two (2) station communication system shall be provided and installed between the tip of the aerial device and the aerial operator's position. The communication speaker at the tip shall require no operator attention to transmit or receive. The transmitting receiving volume controls shall be located at the aerial operator's position.

# AERIAL TIP LOCATOR LIGHTS

Two (2) lights shall be installed at the tip of the aerial device, one (1) each side, to help locate the tip of the aerial during fire ground operations.

Whelen L51AP series, LED beacons shall be provided and installed as specified.

The light(s) shall be amber in color.

#### AERIAL SPOTLIGHTS

All 12VDC aerial spotlights lights shall be mounted below handrail height, so as not to increase the overall height of the vehicle.

#### TRACKING LIGHTS

Two lights shall be mounted at the rear of the base ladder section handrails, one (1) each side. The lights shall be capable of swiveling 180 degrees.

Unity 12VDC LED spotlight(s) model CG series shall be provided.

#### **12VDC TIP LIGHT(S)**

Two (2) 12VDC lights shall be mounted at the tip of the fly ladder section, one (1) each side. The lights shall be capable of swiveling 180 degrees and shall be mounted below handrail height, so as not to increase overall height of the vehicle.

Whelen Pioneer Plus PCH1 series, 12 VDC, single panel, Super LED combination spot/flood light(s) shall be provided. Each light shall draw 6.5 amps and generate 12,000 lumens.

Light(s) shall include a white finish housing.

#### TURNTABLE WORK LIGHTS

Five (5) TecNiq, model #E03-W000-1, LED turntable work lights shall be installed in the turntable step cover to illuminate the turntable area.

#### WALKWAY ILLUMINATION

The climbing area of the ladder shall be continuously illuminated utilizing a series of light emitting diodes (LED's). The LED's shall be located on both sides of each ladder section and shall be positioned near the ladder rails to maintain a clear walking area. A switch shall be provided on the turntable control console to activate the rung illumination lighting.

The LED lighting shall be Red.

# AERIAL LOAD SENSING SYSTEM

A Loadminder shall be installed at the operator's pedestal indicating the load(s) on the aerial device. The display shall be in the form of a LED illuminated bar graph. The instrument shall be readable in day and night conditions. The display shall be a "real time" display, thereby giving immediate readings to the operator. Additionally, a color-coded bar shall be above and below the actual LED bar graph, to surround the actual reading given to the operator; thereby making the display easier and faster to read. The color-coded bars shall progress from green to yellow, and finally to red. When the LED bar graph illuminates, representing a load on the aerial ladder, the operator need only glance at the display to determine the load applied to the aerial device - in relation to 100% rated aerial device capacity.

The readout given by the display shall be continuous relative to the NFPA compliant aerial device rated capacity as stated in these specifications, and shall include (but not be limited to) the following items:

Accumulated equipment on any and all ladder sections, or at the tip including manufacturer installed items or customer installed items

Accumulated personnel on any and all ladder sections or at the tip

Accumulated ice buildup on any and all ladder sections or at the tip

The total load suspended from any load lifting / rappelling eye installed by the manufacturer

Any load reaction from dynamic loads placed on or realized by the aerial structure

Any water weight or reactionary force realized by the aerial structure

Any combination of the above items

The Loadminder as described shall be designed in such a manner that the operator will not have to refer to an angle indicator, extension tape, or load chart; or be required to guess at, or try to calculate the loads or forces applied to, or interacting with the aerial device at any given time, and in any situation. This shall be in compliance with NFPA 1901. Systems that require the use of a load chart, angle indicator or extension tape shall not be acceptable for safety reasons.

The Loadminder shall be connected to a 100 dB. alarm at the operator's control station that shall sound when the ladder load is above the rated capacity. This alarm system shall also be connected to two (2) LED lights on the end of the base section, one on each side, to provide further notice to the operator of an unsafe condition.

# **EQUIPMENT**

#### AERIAL SPECIAL LABELS

Legible, permanent signs shall be installed in positions readily visible to the operator to provide operational directions, warnings, and cautions. The signs shall describe the function of each control and provide operating instructions.

Warning and caution signs shall indicate hazards inherent in the operation of the aerial device. These hazards shall include, but shall not be limited to:

Electrical hazards involved where the aerial device does not provide protection to the personnel from contact with, or near proximity to, an electrically charged conductor.

Electrical hazards involved where the aerial device does not provide protection to ground personnel who might contact the vehicle when in contact with energized electrically charged conductors.
Hazards from stabilizer motion.

Hazards that can result from failure to follow the manufacturer's operating instructions.

## AERIAL DEVICE SPECIFICATION PLACARD

A permanent label shall disclose the following information relative to the aerial device:

Make

Model

Serial number

Date of manufacture

Rated capacity (s)

Rated vertical height

Rated horizontal reach

Maximum hydraulic system pressure

Hydraulic oil type and capacity

All other appropriate labels to ensure safe operation of the aerial device shall be permanently affixed in conspicuous locations.

## APPARATUS LEVEL INDICATOR(S)

Two (2) bubble type level indicator(s) shall be provided to assist in the aerial device setup. The leveling indicator(s) shall be backlit and color coded indicating the following conditions:

"Green"	Safe Operating Zone.
"Yellow"	Caution Operating Zone.
"Red"	<b>Do Not Operate Zone – Reposition Apparatus.</b>

## FORE/AFT LEVEL

An additional backlit leveling indicator shall be provided and installed to measure fore and aft level of the vehicle.

#### AERIAL SIGN PANELS

There shall be a total of two (2) Aerial sign panels provided and installed on the outside of the aerial base section, one (1) each side, for fire department lettering. Each sign panel shall have a lettering surface of approximately 13" wide x 120" long.

#### SIGN PANEL PAINT

The finished paint color shall be FLNA 41876 (to match 2185) white.

## SPECIAL TOOLS

A toolbox shall be provided with the following special tools for checking the torque of specified bolts as recommended by the aerial manufacturer:

One (1) 1/2" drive, torque wrench One (1) torque multiplier One (1) ABR Backlash Adapter One (1) Crimp Tool HDT-50-00 One (1) 1-1/8" x 6" torque wrench Weld

One (1) 3/4" drive 8" extension One (1) 3/4" drive 13" extension

One (1) 3/4" drive 3/4" hex bit driver One (1) 3/4" drive 1-1/8" standard depth socket One (1) 3/4" drive 1-1/8" deepwell socket One (1) 3/4" drive, 1-5/16" standard socket

One (1) toolbox TB11

#### EQUIPMENT TO BE SUPPLIED

Door Lettering "WATERTOWN" in arch with #1 below - 3" gold Scotchcal with

- 20 dark blue shade and light blue opposite outline
  - Aerial sign board lettering WATERTOWN Red Reflective with black shade and
- 18 border 12"
- 1 NFPA stripe White .5" x 4" x .5" hockey stick on body
- 2 Watertown Door seals
- 2 American Flags upper doors above front outriggers
- 1 Keep Back 500 Feet sign -"Watertown" above front grille 2.5" Gold Leaf Scotchcal with dark blue shade and
- 9 light blue opposite outline
  "T2" front cab corners 3" gold Scotchcal with dark blue shade and light blue
- 4 opposite outline
- 1 Leatherhead PLY 8AH-8 pike pole with butt end
- 216 Turtle Tile 1212BLKPR compartment / Shelf tiles installed
- 40 Turtle tile AM Yellow tile edges installed
- 1 Radio install of FD supplied radios
- 1 Equipment bracket and mounting allowance \$15,000.00
- 1 Aerial inspection at factory for (4) FD personal
- 1 Final inspection at Toyne factory for (4) FD personal
- 1 Contingency allowance

## AERIAL FILTER & LUBE SET

The following Filters and Lube shall be shipped loose to assist in maintenance of the aerial device as described by the manufacturer:

- · One (1) Pressure Filter element
- $\cdot$  One (1) Return Filter element
- · Four (4) Tubes, "Lube-A-Boom" aerial grease
- · One (1) Can, "Lube -A- Rope".

#### **ROOF LADDER MOUNT**

Mounting brackets shall be installed on the outside of the aerial base section to store a single roof ladder. The mounting brackets shall be constructed from aluminum with a dual action sanded finish. The brackets shall be easily accessible from the inside of the ladder section or from the top of the body. The aerial sign plate (if specified) shall be mounted to the outside of the brackets.

The mounting location shall be on the same side of the aerial ladder as the control console.

## **ROOF LADDER MOUNT**

The mounting brackets shall be designed and located to accommodate a 14' roof ladder.

#### STOKES BASKET STORAGE BOX (PAINTED)

A stokes basket storage box shall be provided and installed on the outside of the aerial ladder base section.

The storage box shall be totally enclosed and include a hinged lid with latches. The lid shall be provided with a switch that is tied in to the "Door Open" circuit inside the chassis cab to indicate if the lid is not secured for travel. The storage box shall be fabricated from 3/16" smooth aluminum sheet, be approximately 12" D x 27" H x 90" L and be painted to match the aerial sign panel on the opposite side of the base section.

The storage box shall be easily accessible from the ladder or body.

The side facing, outside painted surface of the storage box shall serve as the aerial sign panel on that side of the apparatus unless otherwise specified.

The storage box shall be located on the side of the aerial ladder opposite from the turntable control console in order to provide maximum visibility for the operator.

#### FLY SECTION LOAD LIFTING/RAPPELLING EYES

The aerial device shall be equipped with two (2) load lifting/rappelling eyes at the tip of the fly section. The load lifting/rappelling eyes, as a pair, shall be rated not to exceed the tip load of the aerial device.

#### **RESCUE ROPE ROLLER ASSEMBLY**

The last rung of the aerial ladder shall be equipped with a removable rescue rope roller assembly. The assembly shall have a stainless-steel shaft, dual tapered roller guide and two (2) pivoting lifting lugs. The assembly shall be rated at 500 lb lift capacity.

## MAP BOX COMPARTMENT

A map box compartment shall be provided in the cab. The compartment shall be large enough to hold three 2" binders.

## MAP BOX FINISH - GRAY

The map box shall be constructed of smooth aluminum with a gray texture exterior finish.

## ENGINE TUNNELL MOUNTING PLATE

A 3/16" smooth aluminum plate shall be provided on the top of the engine tunnel for mounting equipment. The plate shall be spaced 3/4" from the engine tunnel.

## **REAR AERIAL INTAKE**

There shall be a 4" intake installed on the rear of the apparatus to be used for supplying the aerial waterway from an external source.

The intake connection shall be a 4" MNST chrome fitting.

The intake shall be recessed below the ladder compartment.

#### AERIAL INTAKE CAP - 4"

A 4 FNST-LHF chrome cap shall be provided on the external feed aerial intake.

#### WATERWAY RELIEF VALVE

One 3/4" relief valve shall be installed above the butterfly valve.

## STAINLESS STEEL APPARATUS BODY CONSTRUCTION

The entire apparatus body shall be formed by shearing and bending fire apparatus quality stainless steel sheet metal. Metal tubular structures or extrusions shall not be used in the construction of the apparatus body. All edges of the sheared metal shall be sanded to remove any sharp shear edges prior to bending the metal. After shearing and bending, the body shall be assembled on a jig table that is designed to hold all apparatus body parts securely in place to insure an accurately built apparatus body. After the fabricated body parts are secured on the jig, the body shall be welded together using a wire welder to insure proper weld penetration.

The entire apparatus body shall be welded together using only unexposed welding methods. No welds shall be visible on the exterior of the apparatus body. All welds on the exterior of the body shall be ground flush and filled with automotive body filler. Metal or rubber trims shall not be used to hide welds or seams.

#### **COMPARTMENT FLOORS**

All compartment floors shall be constructed of fire apparatus quality stainless sheet steel. The floors shall have a minimum 1" upward flange on the rear wall of the compartment to prevent any possible moisture accumulation in this area. The sides of the floor must be welded the full depth of the compartment to eliminate moisture accumulation. These welds must be placed on the bottom exterior of the compartment so that they are not visible on the interior of the compartment. The front edge of the compartment shall consist of a minimum of four bends to provide additional strength in the compartment floor and shall then form the lower door jamb.

All compartment floors shall be sweep out design. This shall include the lower side compartments, any upper compartments, and the rear face compartment. Any exception to this requirement will cause immediate rejection of bid.

## COMPARTMENT REAR WALLS/BODY SIDES

The compartment rear walls and the apparatus body sides shall be constructed of fire apparatus quality stainless sheet steel. The corners shall be one-piece construction from top to bottom and from the inner body panel to the outer face of the compartment to provide maximum strength. Corners using structural support channels or extrusions that require two or more pieces to be welded together shall not be implemented.

#### SIDE/REAR COMPARTMENT TOPS AND CEILINGS

The side and rear compartment tops and ceilings shall be constructed of fire apparatus quality stainless sheet steel. The ceiling of the lower side compartments in the extended depth section shall also be constructed of this material.

## FENDERWELLS

The left and right side rear fender wells shall be constructed of fire apparatus quality stainless steel sheet steel. A 1" gap shall be provided on the bottom of each side of the circular liner to allow drainage of water and for easy cleanout. Sufficient clearance shall be provided for tire chains. The fender wells shall be thoroughly cleaned and sealed.

## PAINTED FENDERWELLS

The fender wells shall be finish painted the primary exterior color of the apparatus.

Two prevent potential corrosion points, aluminum treadbrite or bolted on overlapping panels shall not be implemented in the construction of the apparatus body.

#### **REMOVABLE INNER FENDER LINER**

The fender wells shall be radius cut and shall have a circular inner liner to prevent rust pockets and for ease of cleaning. The inner liner shall be constructed of high impact polyethylene material and shall be fully removable for chassis suspension access.

## **REMOVABLE INNER FENDER LINER - NO EXCEPTION**

To prevent the accumulation of potential corrosive materials in the fender well area, there shall be no exception to the removable inner fender liner.

#### STAINLESS STEEL FENDERETTE

The fender wells shall be trimmed with a polished stainless steel fenderette. The stainless steel fenderette shall be secured into place with stainless steel fasteners and shall be easily removable for replacement. A black rubber fender welting shall be provided between the fenderette and the inner liner surface. The fenderettes shall protrude from the apparatus body a maximum of 1".

#### **REPLACEABLE FENDERETTE**

The stainless steel fenderette shall be secured to the apparatus body with stainless steel fasteners and shall be easily removable for replacement.

Fenderettes that are welded to the apparatus body are not acceptable.

## COMPARTMENT TOP OVERLAY STAINLESS STEEL

The compartment tops shall be overlaid with **brushed finish stainless steel treadplate.** 

The treadplate shall have a #4 brushed finish with NFPA slip resistance certification.

#### **COMPARTMENT TOP WARNING LABEL - FAMA26**

A permanent label shall be provided on the front and rear of the compartment tops on both sides warning that the area is not designed, constructed or intended to be a stepping, standing or walking surface. The label shall state that the surface is not intended for this purpose and indicate potential injury or death in doing so.

#### FORWARD COMPARTMENT

A compartment shall be provided in front of the apparatus body, just behind the cab. The interior compartment dimensions on both sides shall be 74" high x 50 3/4" wide x 20" usable depth in the lower 17" and transverse above. The transverse area shall be approximately 24" wide.

The compartment shall have a roll up door on both sides.

## DRIVER'S SIDE COMPARTMENT ABOVE FORWARD OUTRIGGER

A compartment shall be provided above the forward outrigger on the driver's side. The interior compartment dimensions shall be 24" high x 29" wide x 26" useable depth.

The compartment shall have a single hinged door with a door opening 24" wide x 21" high.

#### DRIVER'S SIDE COMPARTMENT AHEAD OF REAR WHEELS

A compartment shall be provided in front of the rear wheels on the driver's side. The interior compartment dimensions shall be 74" high x 36" wide x 26" usable depth the entire depth of the compartment from top to bottom.

The compartment shall have a roll up door with a door opening 33 1/4" wide x 64" high.

The roll up door shall have a satin finish.

#### **DRIVER'S SIDE COMPARTMENT #1 ABOVE REAR WHEELS**

A compartment shall be provided in above the rear wheels on the driver's side. The interior compartment dimensions shall be 44" high x 69 3/4" wide x 26" useable depth.

The compartment shall have a roll up door with a door opening 59" wide x 34" high.

#### DRIVER'S SIDE COMPARTMENT # 2 ABOVE REAR WHEELS

A second compartment shall be provided above the rear wheels on the driver's side. The interior compartment dimensions shall be 30" high x 49 3/4" wide x 22" useable depth.

The compartment shall have a roll up door with a door opening 43" wide x 21" high.

The roll up door shall have a satin finish.

#### DRIVER'S SIDE COMPARTMENT BEHIND REAR WHEELS

A compartment shall be provided behind the rear wheels on the driver's side. The interior compartment dimensions shall be 60" high x 43 1/2" wide x 22" usable depth.

The compartment shall have a roll up door with a door opening 40 3/4" wide x 50" high.

The roll up door shall have a satin finish.

## TURN TABLE ACCESS STEPS

There shall be a swing out and down access ladder provided on the left and right side rear corners of the apparatus to access the turntable. The ladders shall be constructed of aluminum and incorporate 6" depth treads spaced no more than 18' apart.

The steps shall be mounted to allow for a 'stair step' type slope. A lower flip down step shall be provided as well.

#### "STEPS EXTENDED" WARNING INDICATOR

The step assembly shall have circuitry that will alert the driver if the steps are not in the stowed position. These shall be incorporated into the door ajar system.

#### PASSENGER'S SIDE COMPARTMENT ABOVE FORWARD OUTRIGGER

A compartment shall be provided above the forward outrigger on the passenger's side. The interior compartment dimensions shall be 24" high x 29" wide x 26" useable depth.

The compartment shall have a single hinged door with a door opening 24" wide x 21" high.

## PASSENGER'S SIDE COMPARTMENT AHEAD OF REAR WHEELS

A compartment shall be provided in front of the rear wheels on the passenger's side. The interior compartment dimensions shall be 74" high x 36" wide x 26" usable depth.

The compartment shall have a roll up door with a door opening 33" wide x 65" high.

The roll up door shall have a satin finish.

#### PASSENGER'S SIDE COMPARTMENT #1 ABOVE REAR WHEELS

A compartment shall be provided above the rear wheels on the passenger's side. The interior compartment dimensions shall be 44" high x 69 3/4" wide x 12" useable depth.

The compartment shall have a roll up door with a door opening 59" wide x 34" high.

The roll up door shall have a satin finish.

#### PASSENGER'S SIDE COMPARTMENT # 2 ABOVE REAR WHEELS

A second compartment shall be provided above the rear wheels on the passenger's side. The interior compartment dimensions shall be  $30^{\circ}$  high x 49 3/4" wide x 22" useable depth.

The compartment shall have a roll up door with a door opening 43" wide x 21" high.

The roll up door shall have a satin finish.

#### PASSENGER'S SIDE COMPARTMENT BEHIND REAR WHEELS

A compartment shall be provided behind the rear wheels on the passenger's side. The interior compartment dimensions shall be 60" high x 43 1/2" wide x 22" usable depth.

The compartment shall have a roll up door with a door opening 40 3/4" wide x 50" high.

The roll up door shall have a satin finish.

## PAINT PROCEDURE - PPG DELFLEET BASE COAT/CLEAR COAT

After the apparatus body has been fully assembled and all mounting holes, etc. have been either punched, machined, or drilled, the apparatus shall be fully disassembled for the paint process.

# Masking or taping off of any portion of the apparatus during the paint process shall not be acceptable. All compartment doors shall be painted separate from the apparatus body.

All seams or flanges on the apparatus body shall be caulked or properly sealed to prevent moisture accumulation in flanged areas.

#### APPARATUS BODY PAINTED OFF CHASSIS

The apparatus body shall be painted prior to being mounted on the chassis. Painting of the body off the chassis will prevent primer and paint overspray on the cab, frame rails and other critical components of the apparatus and drivetrain.

#### There shall be no exception to this requirement.

#### PPG CERTIFIED 10 YEAR LIMITED PAINT WARRANTY

The apparatus body exterior finish paint shall have a 10-year limited warranty. The warranty shall be certified by the manufacturer of the paint. Documentation of this shall be provided to the end user. Any warranty that is extended by the apparatus manufacturer and not backed by the paint manufacturer will not be acceptable.

#### **PPG Commercial OEM Product Warranty Coverage:**

Warranty Inclusions:

- Delamination of the topcoat and/or other layers of paint.
- Cracking or checking due to failure of the product.
- Excessive loss of gloss caused by cracking, checking and hazing.

#### Warranty Exclusions:

- Paint deterioration caused by blisters, bubbles, flaking or other degradation due to rust or corrosion originating from the substrate.
- Hazing, chalking or loss of gloss caused by improper care, abrasive polishes, cleaning agents, heavy-duty pressure washing, or aggressive mechanical wash systems.
- Paint deterioration caused by abuse, scratches, chips, gloss reduction, accidents, acid rain, chemical fallout, road treatment materials/chemicals or acts of nature.
- Any paint that was not applied by Toyne, Inc.
- Claims presented without proper Warranty documentation.
- Failure on finishes performed by Non-PPG Commercial Certified Technicians.
- Failure on finishes due to inadequate film builds.
- Failures due to improper cleaning or surface preparation or failure to follow the product use instructions.

#### THESE ARE THE ONLY WARRANTIES THAT PPG MAKES, AND ALL OTHER EXPRESSED OR

# IMPLIED WARRANTIES, INCLUDING WITHOUT LIMITATIONS, ANY WARRANTY OF FITNESS FOR PARTICULAR PURPOSE OR USE, ARE DISCLAIMED BY PPG.

## APPARATUS BODY COMPARTMENT INTERIOR FINISH

The interior of all apparatus body compartments shall be finished with a gray textured coating.

## NFPA SLIP RESISTANCE CERTIFICATION

Any materials used as a stepping, standing or walking surface shall be certified to be compliant with NFPA 1901 15.7.4. Documentation shall be provided with the completed apparatus.

## **REAR SUPPORT STRUCTURE - HOT DIPPED GALVANIZED**

The apparatus body substructure shall be constructed of high strength ASTM A-36 structural steel with 36,000 psi minimum yield strength.

The substructure shall be designed to provide integral support of the apparatus body, rear step, and the tank mounting cradle system. The entire sub-frame shall be framed and jig welded together to insure a truly square assembly. The substructure shall be fastened to the chassis rails so that the apparatus body may be easily removed from the chassis for repair, replacement or mounting to a new chassis.

No holes shall be drilled into the top or bottom flange of the chassis frame rails. The substructure shall be designed to allow for a 22"- 24" side running board/rear step height when the apparatus is on level ground. All fasteners used to secure the substructure to the chassis frame rails shall be hardened steel with locking type nuts.

After complete assembly of the tank cradle substructure, the entire assembly shall be hot dipped galvanized for superior corrosion protection.

Due to the extreme duty that this apparatus will experience during its intended service life and to prevent rusting and corrosion from shortening the service life of this apparatus, sub frames fabricated of painted/undercoated steel or aluminum tubing shall not be acceptable.

## 20 YEAR REAR STRUCTURAL SUPPORT WARRANTY

The tank cradle shall have a warranty covering structural failure due to corrosion perforation. This warranty shall be in effect for 20 years after delivery of the apparatus to the customer. **NO EXCEPTION**.

## 20 YEAR REAR STRUCTURAL SUPPORT CORROSION WARRANTY

The rear structural support shall have a warranty covering structural failure due to corrosion perforation. This warranty shall be in effect for 20 years after delivery of the apparatus to the customer. **NO EXCEPTION.** 

#### **COMPARTMENT VENTILATION**

Each compartment shall be ventilated to the exterior of the body through a removable metal ventilation plate in the compartment wall or through pass through ventilation into an adjoining compartment.

A cleanable filter material shall be provided behind the plate.

Plastic cover plates will not be acceptable.

## AMDOR ROLL UP COMPARTMENT DOORS

Amdor roll up doors shall be installed on all compartments requesting roll up doors.

The doors shall be constructed of 1" aluminum double wall slats with continuous ball & socket hinge joint designed to prevent water ingression and weather tight recessed dual durometer seals.

The bottom panel shall be double wall reinforced with stainless steel lift bar latching system. The bottom panel flange shall have cut-outs for ease of access with gloved hands.

The slat shoes shall be reusable with positive snap-lock securement. A smooth interior door curtain surface shall be provided to prevent equipment hang-ups. The side frames shall be a one piece design constructed of aluminum.

A top drip rail with non-marring seal, recessed non-marring side seals and a dual leg bottom seal shall be provided.

The door striker shall include support beneath the lift bar to prevent door curtain bounce and potential false door ajar indications.

## ROLL UP DOOR PULL ROPES

Pull ropes shall be provided on the interior of all roll up doors on all high side compartments.

One end of the rope shall be mounted to the bottom portion of the door and the other mounted to the side wall of the compartment. The end shall be mounted in a location that will prevent the strap from hanging out the door opening when the door is closed.

## ROLL UP DOOR SHROUD

Roll up door shrouds shall be provided on ten (10) compartment doors. The shroud(s) shall protect the roll up drum from possible damage from shifting equipment and protect the stored equipment in the compartment from water drainage of snow or rain covered doors when they have been rolled up.

## **DOOR SHROUD DRAINAGE TUBES**

Each roll up door shroud shall have a drain tube that routes liquid to the ground.

## **COMPARTMENT DOORS - STAINLESS STEEL**

For compartments requiring flush hinged doors:

All side compartment doors shall be double paneled and designed to fit flush with the side of the apparatus body. Lap style or beveled style doors shall not be acceptable.

The exterior panel of the door shall be pan formed, shall be a minimum of 1 5/8" thick, and shall be constructed of fire apparatus quality stainless steel sheet material. The outer pan shall be double flanged, in and down, to provide full perimeter support for the interior panel.

All compartments that have double doors shall have the interior panel offset on the interior of the second door to allow the first door to shut tightly against the offset portion. Any compartments with double doors shall not require a center door jamb allowing full unobstructed access to the compartment.

## **INNER DOOR PANEL - ALUMINUM TREADBRITE**

The interior panel of the door shall be constructed of aluminum treadbrite and shall be removable for access to the interior of the door and to allow mounting equipment to interior door panel. Interior door panels that are permanently welded or glued into place shall not be acceptable.

## **COMPARTMENT DOOR HINGES**

All compartment doors shall have full length polished stainless-steel hinge. The hinge shall have a minimum pin diameter of 1/4". The hinge shall be fastened to the door and to the apparatus body with stainless steel fasteners.

Fasteners used to secure the hinge shall not be visible on the exterior of the apparatus body. A dielectric isolation barrier shall be provided between the hinge and the door as well as between the hinge and the apparatus body. The hinge must be removed from both the apparatus body and compartment door during the paint process.

#### COMPARTMENT DOOR LATCHES

All compartment door latches shall be a single point center latch with double catch. The latch shall be a 'slam' type latch. Use of pin type latches shall not be acceptable. The entire latch mechanism must be located inside the double pan door to prevent any possible fouling or damage to the latch in the event equipment stored in the compartment shifts. The latches shall be activated by a non-directional stainless-steel D ring handles. The handle shall be bent slightly to allow for easy grasp of the handle.

## DOUBLE DOOR SECOND DOOR LATCH - CABLE OPERATED

A latch shall be provided on the interior of the second door on all double door compartments. A pull cable shall be provided on the interior of the second door of all high compartment doors to activate the latch with a gloved hand.

## VERTICALLY HINGED COMPARTMENT DOOR RETENTION DEVICE

Hansen 5EZ enclosed stainless steel door retention devices shall be provided on all vertically hinged compartment doors. The device shall be bolted to the door and to the apparatus with stainless steel fasteners. These fasteners shall not visible on the exterior of the apparatus body. The adjustable spring mechanism shall hold the door firm, but not rigid, in either the open or closed position. The use of chain, cable or devices that are required to be manually unlatched to close shall not be acceptable.

#### HORIZONTALLY HINGED COMPARTMENT DOOR RETENTION DEVICE

All horizontally hinged doors shall be provided with pneumatic lift devices of adequate rating to hold the door in the open position. The device shall be bolted to the apparatus body and the interior door liner and shall be provided with 5 position adjustment brackets to allow the open height of the door to be easily adjusted.

## **COMPARTMENT DOOR SOUND DEADENING**

After the compartment door has been painted, polystyrene insulation panels shall be placed on the interior of the door between the outer skin and the removable inner liner. These panels shall provide for a more solid sounding door when closing the door. Use of sprayed on material for sound deadening will not be permitted.

#### **COMPARTMENT DOOR WEATHER STRIPPING**

All compartment doors shall be weather stripped the entire perimeter of the compartment door opening. All weather stripping shall be heavy duty automotive hollow core type. Sponge type materials shall not be acceptable. All weather stripping must be applied to a metal backing. Clip on type weather stripping shall not be used on the perimeter of the compartment. All double door compartments shall have a metal crimp type weather strip applied to the offset interior panel.

#### **COMPARTMENT DOOR RUBBER BUMPERS**

Rubber bumpers shall be provided on the exterior of any hinged door that may come into contact with another door when opened.

## HINGED COMPARTMENT DOOR PAINTING PROCEDURE

All hinged compartment doors that are to be finish painted must be fitted on the apparatus body prior to painting, removed and fully disassembled for painting. All hinges, latches, handles and inner liners must be removed for the paint process to insure proper paint coverage.

#### STAINLESS STEEL COATED FASTENERS

All fasteners used in the finish construction of the apparatus body shall be marine grade stainless steel. Fasteners that pass through a dissimilar metal panel shall be Magna-Gard, or equal, coated to help prevent metal reaction and corrosion.

As the Magna-Gard, or equal, coating is a "baked on" type coating providing for excellent adhesion to the fastener, spray on type coatings may be used in conjunction with the Magna-Gard, or equal, but not in place of it.

Because dissimilar metal corrosion is a common occurrence on all apparatus and the Magna-Gard (or similar "baked on" coatings) fasteners are commercially available to all manufacturers and is not a proprietary product, there shall be no exception to this requirement.

## ELECTROLYSIS CORROSION CONTROL

The apparatus shall be assembled using ECK or electrolysis corrosion control, on all high corrosion potential areas, such as door latches, door hinges, trim plates, fenderettes, etc. This coating is a high zinc compound that shall act as a sacrificial barrier to help minimize electrolysis and corrosion between dissimilar metals. This shall be in addition to any other barrier material that may be used.

## **RUBRAILS - BRIGHT ANODIZED ALUMINUM**

Extruded aluminum rub rails shall be provided on the apparatus body sides. The rub rails shall have a bright finish with anodized coating to protect the finish. The rub rails shall be spaced from the apparatus body a minimum of 1/4" with poly spacers.

The rub rails must be bolted on to the apparatus body to allow easy replacement if damaged. Rub rails that are permanently fastened to the apparatus body by welding or any other permanent method will not be acceptable. **NO EXCEPTION WILL BE ALLOWED TO THIS REQUIREMENT.** 

#### **RUB RAIL ENDS**

The rub rail ends shall be 'capped' with a high impact resistant black EPDM contoured block.

## STAINLESS STEEL SILL PLATES

<u>Twelve (12)</u> brushed stainless steel sill plates shall be provided and installed on the lower door jamb(s) of designated compartments.

#### **GROUND LADDER STORAGE COMPARTMENT**

A storage compartment shall be provided on the rear of the apparatus inside the aerial torque box. The compartment shall have individual slides for each ladder to allow individual removal of ladders. The individual slides shall be lined with a slip material to allow easy removal of the ladders. The ladder storage rack shall be a one piece assembly which is easily removable from the torque box without disassembly.

## PIKE POLE STORAGE COMPARTMENT

A pike pole storage compartment shall be provided on the rear of the apparatus inside the aerial torque box. The compartment shall have individual tubes for each pike pole. The tubes shall be constructed of PVC or aluminum.

## LADDER ACCESS DOOR - ROLL UP

The ladder compartment shall have a roll up door.

The door shall have a painted finish.

## LADDER ACCESS INTERIOR DOOR

A hinged aluminum plate type door shall be provided inside the roll up door to prevent the ladders from jamming the roll up door.

## **DUO SAFETY 10' ALUMINUM FOLDING ATTIC LADDER**

One (1) Duo Safety 585A 10' NFPA compliant aluminum folding attic ladder shall be provided and mounted.

## ALCO-LITE 35' 2-SECTION ALUMINUM LADDER

One (1) Alco-Lite PEL-35, 35' NFPA compliant two section aluminum extension ladder shall be provided and mounted.

## ALCO LITE 24' 2-SECTION ALUMINUM LADDER

Two (2) Alco Lite model PEL-24, 24' NFPA compliant two section aluminum extension ladder shall be provided and mounted.

## ALCO LITE 16' ALUMINUM ROOF LADDER - DOUBLE END HOOKS

Two (2) Alco Lite DRL-16, 16' NFPA compliant aluminum roof ladder with folding hooks (both ends) shall be provided and mounted.

## ALCO LITE 20' ALUMINUM ROOF LADDER

One (1) Alco Lite PRL-20, 20' NFPA compliant aluminum roof ladder with folding hooks shall be provided and mounted.

## ALCO LITE 16' ALUMINUM COMBINATION LADDER

One (1) Alco Lite CJL-16, 16' NFPA compliant aluminum combination roof ladder with folding hooks shall be provided and mounted.

## FIRE HOOKS NYFG 4' FIBERGLASS PIKE POLE - two (2)

There shall be two (2) Fire Hooks "New Yorker" NYFG-4, 4' fiberglass pike pole(s) provided and mounted on the apparatus.

## FIRE HOOKS NYFG 6' FIBERGLASS PIKE POLE - two (2)

There shall be two (2) Fire Hooks "New Yorker" NYFG-6, 6' fiberglass pike pole(s) provided and mounted on the apparatus.

## FIRE HOOKS NYFG 8' FIBERGLASS PIKE POLE - two (2)

There shall be two (2) Fire Hooks "New Yorker" NYFG-8, 8' fiberglass pike pole(s) provided and mounted on the apparatus.

## FIRE HOOKS NYFG 10' FIBERGLASS PIKE POLE - two (2)

There shall be two (2) Fire Hooks "New Yorker" NYFG-10, 10' fiberglass pike pole(s) provided and mounted on the apparatus.

## DRIVER'S SIDE FRONT OF WHEELWELL SPARE CYLINDER COMPARTMENT

A compartment shall be provided in the wheel area in front of the rear axle on the driver's side to hold three spare SCBA cylinders.

The compartment shall be injection molded high strength polyethylene designed specifically for the SCBA cylinder storage. The compartment shall be slanted towards the rear and have a drain port at the low point of the compartment.

## DRIVER'S SIDE BETWEEN TANDEM WHEELWELL SPARE CYLINDER COMPARTMENT

A compartment shall be provided in the wheel area between the tandem axles on the driver's side to hold two spare SCBA cylinders.

The compartment shall be injection molded high strength polyethylene designed specifically for the SCBA cylinder storage. The compartment shall be slanted towards the rear and have a drain port at the low point of the compartment.

## DRIVER'S SIDE REAR OF WHEELWELL SPARE CYLINDER COMPARTMENT

A compartment shall be provided in the wheel area behind the rear axle on the driver's side to hold two spare SCBA cylinders.

The compartment shall be injection molded high strength polyethylene designed specifically for the SCBA cylinder storage. The compartment shall be slanted towards the rear and have a drain port at the low point of the compartment.

NOTE: The door for this compartment shall also cover the chassis fuel fill.

## PASSENGER'S SIDE FRONT OF WHEELWELL SPARE CYLINDER COMPARTMENT

A compartment shall be provided in the wheel area in front of the rear axle on the passenger's side to hold two spare SCBA cylinders.

The compartment shall be injection molded high strength polyethylene designed specifically for the SCBA cylinder storage. The compartment shall be slanted towards the rear and have a drain port at the low point of the compartment.

#### PASSENGER'S SIDE BETWEEN TANDEM WHEELWELL SPARE CYLINDER COMPARTMENT

A compartment shall be provided in the wheel area between the tandem axles on the passenger's side to hold two spare SCBA cylinders.

The compartment shall be injection molded high strength polyethylene designed specifically for the SCBA cylinder storage. The compartment shall be slanted towards the rear and have a drain port at the low point of the compartment.

## PASSENGER'S SIDE REAR OF WHEELWELL SPARE CYLINDER COMPARTMENT

A compartment shall be provided in the wheel area behind the rear axle on the passenger's side to hold three spare SCBA cylinders.

The compartment shall be injection molded high strength polyethylene designed specifically for the SCBA cylinder storage. The compartment shall be slanted towards the rear and have a drain port at the low point of the compartment.

## WHEELWELL STORAGE COMPARTMENT DOORS - MIRROR FINISH STAINLESS

Mirror finish stainless steel access doors shall be provided on each wheel well storage compartment in the wheel well.

The doors shall be secured using chrome plated thumb lever latches.

## WHEELWELL SCBA CYLINDER COMPARTMENT RETENTION STRAPS

One 1" wide loop of high visibility yellow webbing shall be installed in each wheel well spare cylinder compartment for each cylinder to be stored in the compartment. The loop(s) shall be designed to loop around the cylinder valve and help prevent the cylinder from sliding out of the compartment if the door is not latched or fails.

## APPARATUS BODY UNDERCOATING

The apparatus body shall be undercoated after assembly is completed. A bituminous based automotive type undercoat shall be used. Care shall be taken to avoid undercoat application to items that would hinder normal maintenance.

#### LEFT (DRIVER'S) SIDE FUEL FILL DOOR

A chassis fuel fill shall be located in the driver's side rear wheel well. The fill shall be located behind a mirrored finish stainless steel hinged door with flush latch. The fuel fill shall be properly vented.

## FRAME RAIL TOW EYES - CHROME PLATED

Two 3/4" chrome plated steel tow eyes shall be attached direct to the end of the frame rails on the rear of the apparatus. The eyes shall have a minimum of a 3" diameter pass through. Each eye shall be attached to the frame rail with a minimum of four 3/4" hardened steel bolts with locking nuts.

## **DUAL COMPARTMENT SHELF TRACKS - ALUMINUM**

Ten (10) sets consisting of four heavy duty aluminum adjustable tracks shall be provided in specified compartments, two for each end of shelf.

The tracks shall not be welded to the apparatus body.

#### FULL DEPTH COMPARTMENT SHELVING - 3/16"

There shall be fifteen (15) full depth shelves provided. The shelves shall be constructed of 3/16" smooth aluminum with a 2" upward bend on the front and rear edges.

The shelves shall have a random orbit sanded finish.

## STATIONARY VERTICAL COMPARTMENT PARTITION

Two (2) stationary vertical compartment partition(s) shall be provided. The partition(s) shall be bolted into place with stainless steel fasteners. The partition(s) shall be constructed of 3/16" smooth aluminum with random orbit sanded finish.

The partition(s) shall have a random orbit sanded finish.

#### ADJUSTABLE TRACK FOR SCBA BRACKETS

Eight (8) set(s) consisting of two heavy-duty horizontally mounted adjustable tracks shall be provided in specified compartments. The tracks shall allow SCBA brackets to be mounted to the compartment wall and be adjustable.

The tracks shall be removable and shall not be welded to the apparatus body.

#### **<u>16 SCBA CYLINDER RACK</u>**

A 16-cylinder storage rack(s) shall be provided. The rack shall be constructed of 1/8" smooth aluminum with DA finish.

#### **ROLL OUT TRAY - ON SCENE**

There shall be three (3) roll out tray(s) provided. The tray shall be constructed of 3/16" aluminum. The tray shall have a 2" upward bent lip on all four sides of the tray.

On Scene Solutions 81 series 1,000 lb. total capacity heavy duty telescoping slides shall be provided. The tray shall capable of 100% extension.

A positive latching mechanism shall be provided to hold the tray in either the fully open or fully closed position.

## ON SCENE SOLUTIONS MODEL 85 ROLL OUT TOOL BOARD

There shall be three (3) On Scene Solutions model 85roller assembly for a vertically mounted roll out tool board. A top guide assembly shall also be provided.

The tool board shall be constructed of 3/16" aluminum. The board shall have a 1" bent lip on all four sides of the board with the top and bottom bends being opposite of the inner/outer.

A positive latching mechanism shall be provided to hold the board in either the fully open or fully closed position.

#### STORAGE DRAWER CABINET

One (1) C-TECH two drawer storage cabinet(s) shall be provided and installed in the apparatus. The cabinet overall exterior dimensions shall be 40" wide x 16" high x 25" depth. The cabinet shall have two equally sized drawers. The drawers shall be mounted on heavy duty ball bearing type telescoping slides. The cabinet and drawers shall be constructed of smooth aluminum with black painted finish.

The drawer cabinet shall have a red exterior finish.

#### NFPA 1901 CERTIFIED 12 VOLT ELECTRICAL SYSTEM

The 12-volt apparatus body electrical system shall be provided and shall be in compliance with NFPA 1901 testing and certification procedures as follows:

## NFPA MINIMUM ELECTRICAL LOAD DEFINITION

The NFPA 1901 defined minimum electrical load shall consist of the total amperage required to simultaneously operate the following in a stationary mode:

- Propulsion engine and transmission.
- The clearance and marker lights.
- Communication equipment (5-amp default).
- Illumination of all walking surfaces, the ground at all egress points, control and instrumentation panels and 50% of total compartment lighting.
- Minimum warning lights required for "blocking right of way" mode.
- The current to simultaneously operate aerial and all specified electrical devices.
- Anything defined by the purchaser, in the advertised specifications, to be critical to the mission of the apparatus.

## **RESERVE CAPACITY TEST**

A Reserve Capacity Test shall be performed on the completed apparatus. All items listed in NFPA Minimum Load Definition shall be activated with the engine shut off. After 10 minutes of operation, those items shall be deactivated. After deactivation, the battery system shall have ample reserve to start the engine.

## ALTERNATOR PERFORMANCE TEST AT IDLE

An "alternator performance test at idle" test shall be completed. The minimum continuous electrical load shall be activated with the engine running at idle speed. When the engine temperature has been stabilized at idle speed, the battery system shall be tested to detect any battery discharge current.

## ALTERNATOR PERFORMANCE TEST AT FULL LOAD

An "alternator performance test at full load" test shall be completed. The minimum continuous electrical load shall be activated with the engine running up to the engine manufacturer's governed speed for a 2 hour period.

## TEST CONDITIONS

All electrical testing shall be performed with the engine compartment at approximately 200 degrees.

## **<u>12-VOLT WIRING SYSTEM</u>**

All 12-volt electrical wiring shall be SXL cross link rated to carry 125% of the maximum current for which the circuit is protected. The wire shall be of sufficient size so that voltage drop in any electrical device does not exceed 10%. All wiring shall be color, number, and function coded with the number and function being printed every 3" along the entire length of all apparatus body wires (as required by NFPA 1901). All wiring shall be routed through heavy duty PVC split loom securely attached and protected against heat, oil, and physical damage. All locations where the wire passes through a body panel shall be protected with electrical grommets.

All connections shall be made using mechanical connectors and be screwed to terminal or junction box with machine screws. Wire nut, insulation displacement, or piercing connections shall not be used.

All circuits shall be provided with properly rated low voltage over current protective devices of the automatic reset type.

Removable access panels shall be provided to provide access to the wire and electrical components.

## MULTI-PLEXED ELECTRICAL SYSTEM

The apparatus body electrical system shall incorporate a Multiplexed Electrical System. The multiplex system shall consist of all solid-state components contained inside aluminum extrusions referred to as nodes. Each node shall consist of (24) output channels and (24) input channels. All inputs and outputs will be configured into an electrical harness utilizing Deutsch connectors. The nodes must be waterproof and not require special mounting requirements.

The system, at a minimum, shall be capable of performing the following functions: load management sequencing, switch loads, receive digital and analog signals, perform and report diagnostics, continuously report vehicle status and the system is expandable.

Placement of nodes throughout the apparatus enables a reduction in wire harness bundles, elimination of redundant harnesses and separate circuit boards, relay and circuit breakers, electrical hardware, separate electrical or interlock subsystems and associated electronics for controlling various electrical loads and inputs. The multiplex system shall be field re-programmable and re-configurable by any authorized dealer or service center. This complete system shall eliminate the need for the following separate components or devices: load manager, load sequencer, warning lamp flasher, door open notification system, interlock modules, separate volt meter and ammeter.

The Base System Shall Include:

- Total Load Management
- Load Shedding Capabilities
- Load Sequencing Capabilities
- "On-Board" Diagnostics Readout
- Very Reliable, Solid-State Hardware
- Error Reporting
- Continuous system monitoring and reporting
- Emergency warning lamp flasher
- Door Ajar System
- Field Configurable
- Expandability Capabilities
- Advanced PC Diagnostics

As-built wiring harness drawings and a master circuit list of electrical circuits that the apparatus builder installs shall be furnished in the delivery manuals. These schematics must show the electrical system broken down into separate functions, or small groups of related functions. Schematics shall depict circuit numbers, electrical components, harnesses, and connectors from beginning to end. A single drawing for all electrical circuits installed by the apparatus builder shall not be accepted.

#### VMUX WARRANTY

The VMUX multiplexed electrical system shall be warranted, under normal use and service, for a period of four years. One year parts and labor and the remaining three years parts only.

## **REAR LICENSE PLATE LIGHT/BRACKET**

A chrome plated LED license plate light shall be provided on the rear of the apparatus.

A license plate mounting bracket shall be provided that spaces the license plate away from the apparatus body.

The license plate shall be on the left side lower rear.

## **CLEARANCE LIGHTS/REFLECTORS**

All apparatus body clearance lights shall be LED style. All lower clearance lights and reflectors shall be mounted in a manner that provides protection from damage, and shall comply with FMVSS-108 regulations.

## MID-MOUNTED SIDE TURN SIGNAL - LED

An amber LED side turn signal shall be provided in the mid-section area of the apparatus on both sides.

#### **EXTENSION CLEARANCE LIGHTS - LED**

There shall be a rubber arm style extension LED marker lights installed one each side of the apparatus on the rear corners of the body. These lights shall help the driver locate the rear of the apparatus during driving operations. The lights shall have bulbs facing both forward and to the rear. The forward facing lights shall be amber in color and the rear facing lights shall be red in color.

#### DUAL TRACK TYPE LED COMPARTMENT LIGHTING

Each apparatus body compartment shall have two track type LED lights vertically mounted in the compartment. The lights shall be constructed of an unbreakable type clear poly type flexible material housed in an aluminum extrusion.

A compartment that is considered a 'full height' compartment shall each have two 48" long light sections and a 'low height' or above wheel compartment shall each have two 18" long sections.

The lights shall function automatically and independently of other compartments when the compartment door is opened. Compartment lighting systems that are controlled by a single, dash mounted switch are not acceptable.

## **COMPARTMENT LIGHT SWITCHES**

Each hinged apparatus body door compartment shall have a magnetic style reed indicator switch.

Each roll up door shall have an integral door open indicator magnet in the lift bar. If the bar is not properly closed, it shall activate the "Door Open" light in the cab.

The compartment lights shall function automatically when the door is opened. A master compartment light switch shall not be acceptable.

#### **DOOR AJAR INDICATOR SPLIT SIDES AND CAB**

A door ajar system shall be provided on the apparatus that will indicate each of the following:

- Driver's side cab door open red
- Officer's side cab door open red
- Driver's side body door open red
- Officer's side body door open red
- Rear body door open -red

#### ZONE A UPPER WARNING LIGHTING

The lightbar shall be provided on the chassis. Specifications for the lightbar are listed in the chassis specifications.

## WHELEN M6R UPPER ZONE B/D WARNING LIGHTING

Two Whelen ION-T TLIR red LED light heads shall be mounted on each side of the apparatus above the side compartments.

TIONFC chrome plated trim housings shall be provided.

## WHELEN M6R UPPER ZONE C WARNING LIGHTING

Two Whelen model M6R red LED light heads shall be mounted on the rear of the apparatus, one each side.

M6FC chrome plated trim housings shall be provided.

## WHELEN M6 QUAD-CLUSTER TAILLIGHTS - LED

Whelen M6BTT 4" x 6" LED taillights and M6T 4" x 6" LED turn signals shall be provided. The backup lights shall be M6BUW 4" x 6" clear LED's.

An additional space shall be provided in the quad-cluster for the lower C warning lights.

M6FCV4 polished trim housings shall be provided.

## **BACKUP LIGHTS PARK FUNCTION**

The backup lights shall automatically activate when the park brake is set to provide work lighting at the rear of the apparatus.

#### **MID-SECTION WARNING LIGHTS - SIDES**

One Whelen M6R red LED light shall be provided on each side in the mid-section of the apparatus.

M6FC chrome trim housings shall be provided.

The light shall be mounted on the outrigger cover.

#### SIDE FACING LOWER REAR WARNING LIGHTS

One Whelen M6R red LED light shall be provided on each side of the apparatus as low and as far rearward as possible on the apparatus.

M6FC chrome trim housings shall be provided.

The light shall be mounted on the outrigger cover.

#### **REAR FACING LOWER WARNING LIGHTS**

Two Whelen M6R red LED lights shall be provided on the lower rear of the apparatus.

M6FC chrome trim housings shall be provided.

#### SIREN NOISE WARNING LABEL - FAMA42

A permanent label shall be provided inside the driver's door warning of potential injury that could be received from the noise of the siren. The label shall also state safety precautions that should be taken when the siren is in use.

## **OPTICAL WARNING LIGHT CERTIFICATION**

The emergency warning light system shall be certified using one of the available methods provided for in NFPA 1901 13.8.16.

## ELECTRICAL SYSTEM PERFORMANCE CERTIFICATION

A written load analysis and the results of the electrical system performance test shall be provided with the completed apparatus. The load analysis shall include the following:

- Nameplate rating of the alternator.
- The alternator rating under the conditions specified in NFPA 1901 13.3.2.
- Each of the component loads specified in NFPA 1901 13.3.3 that make up the minimum continuous electrical load.
- Additional electrical loads that, when added to the minimum continuous electrical load, determine the total continuous electrical load.
- Each individual intermittent electrical load.

## **110 VOLT SHORELINE CONNECTION IN COMPARTMENT**

There shall be two (2) duplex 110-volt shoreline connection(s) provided in the apparatus body compartment(s) for charging accessory items.

## SHORELINE/GENERATOR TRANSFER SWITCH

A Kussmaul 091-134 transfer switch shall be provided to automatically switch the shoreline connection power source from landline connection to the onboard 110-volt power source.

## HEAVY DUTY 12 VOLT POWER SOURCE

Two (2) heavy duty 12-volt power source(s) shall be provided to allow Fire Department to connect various types of equipment. The power source shall implement dual 4-gauge copper cable with the positive cable routed to the chassis battery system and the negative cable grounded to the chassis frame rails. An appropriately sized replaceable in-line fuse shall be provided.

A heavy duty 12 volt quick-disconnect shall be provided with matching plug.

## WHELEN MPBW SCENE LIGHT - 12 VOLT

Two (2) Whelen Micro Pioneer model MPBW scenelight(s) shall be mounted on the apparatus using a bail mount. The lighthead(s) shall be 12-volt LED and shall draw 4 amps creating 4,100 lumens total.

## HARRISON 10.0 KW PTO/HYDRAULIC GENERATOR

A Harrison model 10.0MAS-16R4A 10.0 kw PTO/hydraulic powered generator shall be provided and mounted to manufacturers recommendations.

The generator shall be 120/240 volts AC (84/42 amps), single phase, rated at 10,000 watts. The generator shall produce its constant rated electric power output between 950-3300 revolutions per minute engine speed with less than .25 Hz deviation. Except where superseded by the requirements of NFPA 1901, all components, equipment, and installation procedures shall conform to NFPA 70, National Electric Code, (NEC).

Line voltage electrical system equipment and materials included on the apparatus shall be listed and installed in accordance with the manufacturer's instructions. All products shall be used only in the manner for which they have been listed. All power source system mechanical and electrical components shall be sized to support the continuous duty nameplate rating of the power source.

## HYDRAULIC FLUID RESERVOIR

A 2 to 3 gallon reservoir shall be provided and mounted in area above the system to allow gravity flow of hydraulic fluid to the system and allow easy filling of the reservoir. The reservoir shall have a replaceable filter that is easily accessible.

## HYDRAULIC GENERATOR START SWITCH - CAB CONSOLE

The hydraulic generator start/stop control shall be located on the cab console. The activation switch shall include an integrated indicator light that illuminates when the generator is running.

## HYDRAULIC GENERATOR PTO - "HOT SHIFT" TYPE

The generator shall be powered by a Chelsea or Muncie "Hot Shift" type PTO. A lighted and guarded switch shall be provided on the control console that electrically engages/disengages the PTO.

## HYDRAULIC GENERATOR MOUNTING

The generator shall be mounted in the forward area of the hose bed properly protected and ventilated to prevent overheat. A front hose bed bulkhead shall also be provided.

A stainless steel treadbrite cover shall be provided to cover any hydraulic hoses that extend through the front of the apparatus body then into the compartment.

## **GROUNDING**

Grounding shall be in accordance with Section 250-6 "Portable and Vehicle Mounted Generators" of the NEC. Ungrounded systems shall not be used. Only stranded or braided copper conductors shall be used for grounding and bonding. An equipment grounding means shall be provided in accordance with Section 250-91 (Grounding Conductor Material) of the NEC. The grounded current carrying conductor (neutral) shall be insulated from the equipment grounding conductors and from the equipment enclosures and other grounded parts. The neutral conductor shall be colored white or gray in accordance with Section 200-6 (Means of Identifying Grounding Conductors) of the NEC.

In addition to the bonding required for the low voltage return current, each body and driving or crew compartment enclosure shall be bonded to the vehicle frame by a copper conductor. This conductor shall have a minimum amperage rating of 115 percent of the nameplate current rating of the source specification label as defined in Section 310-15 (amp capacities) of the NEC. A single conductor properly sized to meet the low voltage and line voltage requirements shall be permitted to be used.

## MAIN OVERCURRENT PROTECTION DEVICE

A main overcurrent protection device shall be provided on the generator. The device shall be factory installed by the generator manufacturer.

## WIRING METHODS

All fixed wiring systems shall be either metallic or nonmetallic liquid tight conduit or shall be type SO or SEO with a WA suffix, rated at 600 volts at not less than 194 degrees Fahrenheit.

Electrical cord or conduit shall not be attached to chassis suspension components, water or fuel lines, air or air brake lines, hydraulic lines, exhaust system components or low voltage wiring.

All wiring shall be separated by a minimum of 12", or properly shielded, from exhaust piping and shall be separated from any fuel lines by a minimum of 6".

Electrical cord or conduit shall be supported within 6" of any junction box and at a minimum of every 24" of continuous run. Supports shall be made of nonmetallic materials or corrosion protected metal. All supports shall be of a design that does not cut or abrade the conduit or cable and shall be mechanically fastened to the vehicle.

## BREAKER PANEL BOARD

Each individual circuit that is to be powered by the generator shall have a branch circuit overcurrent protection device (circuit breaker). The device shall be sized at not less than 15 amps in accordance with Section 240-3 (Protection of Conductors) of the NEC. If more than 6 individual branch circuits are required on the apparatus, the panel board shall have a main breaker. The panel board shall be readily visible and located so that there is unimpeded access to the panel board controls.

All line voltage conductors located in the main panel board shall be individually and permanently identified. The identification shall reference the wiring schematic or indicate the final termination point. When pre-wiring for future power sources or devices, the unterminated ends shall be labeled showing its function and wire size.

A hinged access door shall be provided on the panel board.

## LOAD BALANCING

The breaker panel shall be load balanced to allow the most efficient distribution of the AC load as possible.

## **BREAKER PANEL LOCATION**

The breaker panel shall be located on the upper rear wall of the driver's side compartment ahead of the rear wheels.

## BREAKER PANEL WARNING LABEL - FAMA27

A permanent label shall be provided on the breaker panel. The label shall warn of electrical shock hazards, proper service procedures and indicate potential injury or death due to improper use and service.

## FROG DISPLAY

There shall be a FROG D provided with the generator. The FROG D shall automatically sense a generator signal and begin displaying information. The digital meter display shall constantly monitor and display voltage, frequency (accurate to within 1 decimal point) and current draw on two separate lines. The display shall be capable of displaying total accumulated run time hours when the MODE button is pressed.

The FROG meter shall be located adjacent to or below the breaker panel.

#### SHORELINE TRANSFER SWITCH

A transfer switch shall be provided to automatically switch the shoreline connection power source from landline connection to onboard 110-volt power source.

Whelen Pioneer 120v. LED surface mount scenelights

## LEFT SIDE WHELEN PCP2AFS SCENE/SPOT LIGHT - 120 VOLT

One (1) Whelen Pioneer PCP2AFS combination scene/spot light(s) shall be mounted on the left side of the apparatus using a PBAPED pedestal mounting bracket.

## **RIGHT SIDE WHELEN PCP2AFS SCENE/SPOT LIGHT - 120 VOLT**

One (1) Whelen Pioneer PCP2AFS combination scene/spot light(s) shall be mounted on the right side of the apparatus using a PBAPED pedestal mounting bracket.

## CAB SWITCH - 110/240 VOLT TELESCOPING LIGHTS

Two (2) Switch(es) shall be provided in the cab to turn on the designated AC pedestal mounted lights from the cab.

## **120 VOLT RECEPTACLES**

All 120-volt receptacles shall be installed to current NFPA 1901 recommendations and NEC guidelines.

Receptacles installed in a wet location shall be of the grounding type with a wet location cover and installed not less than 24" from the ground. Receptacles on off-road vehicles shall be a minimum of 30" from the ground. The face of any wet location receptacles shall be installed in a plane from vertical to not more than 45 degrees off vertical.

Receptacles installed in a dry location shall be of the grounding type and installed not less than 12" from the ground or be installed in a face up position.

All wiring for both wet and dry locations shall be routed through liquid tight flexible conduit rated at not less than 194 degrees. Each receptacle shall be wired to the panel board which shall have separate adequately sized breakers for each receptacle.

Receptacles shall be provided in the following locations:

There shall be three (3) house hold type 5-15 receptacle(s) provided in apparatus body compartment(s).

#### 240 VOLT RECEPTACLE(S)

There shall be two (2) 240-volt receptacles provided

#### Wet Location

All wet location receptacle outlets shall be of the grounding type with a wet location cover and installed in accordance with Section 210-7 (Receptacles and Cord Connections) of the NEC.

All wet location receptacles shall be installed not less than 24" from the ground. Receptacles on off-road vehicles shall be a minimum of 30" from the ground. The face of any wet location receptacles shall be installed in a plane from vertical to not more than 45 degrees off vertical. No receptacle shall be installed in a face up position.

#### Dry Location:

All receptacles located in a dry location shall be of the grounding type. Receptacles shall not be less than 30 inches above the interior floor height.

#### Receptacle Wiring:

All wiring for both wet and dry locations shall be routed through liquid tight flexible conduit rated at not less than 194 degrees. Each receptacle shall be wired to the panel board which shall have separate breakers for each receptacle.

#### Outlet Location(s):

240-volt receptacles shall be provided in the following locations:

## HANNAY ELECTRIC REWIND CORD REEL

There shall be two (2) Hannay model ECR1618-17-18 electric rewind cord reel(s) provided and properly mounted.

The reel(s) shall be wired to the electrical panel board through flexible PVC conduit. An individual breaker shall be

provided at the panel for the reel. A momentary push button switch shall be provided, mounted in close proximity to each reel for activating the electric rewind. The switch shall be labeled "CORD REEL REWIND".

## CORD REEL MOUNTING LOCATION

The cord reel shall be mounted in the above outrigger compartment with access provided by opening the compartment doors.

## 200' 12/3 SEOW-A ELECTRICAL CABLE

A continuous 200' length of 12/3 SEOW-A electrical cable shall be provided on the reel(s). The cable shall be rated at 600 volts at 194 degrees.

## YELLOW ELECTRICAL CABLE

The electrical cable on the cord reel(s) shall be yellow.

## AKRON BRASS EJBX LIGHTED JUNCTION BOX

There shall be two (2) Akron Brass EJBX lighted junction box(es) provided. The box shall be 120-volt single circuit and have a large handle shall be provided on the top of the box to allow a gloved firefighter to carry the box with ease.

The box shall provide lighting around the box in accordance with NFPA 1901. The box shall be designed to keep the exterior electrical components above 2" of standing water and shall be listed for use in wet locations.

The junction box shall an Akron 134-CG 12" pigtail connection with an L5-20P twist lock connection.

Position #1 shall have a 5-20 GFCI duplex 20-amp 120-volt outlet. (BK-1). Position #2 shall have a 5-20 duplex 20-amp 120-volt outlet. (229-R/D). Position #3 shall have a L5-20P single 20-amp twist-lock 120-volt outlet. (224-R). Position #4 shall have a L5-20P single 20-amp twist-lock 120-volt outlet. (224-R).

The junction box shall be standard gray color.

The receptacle covers shall be standard gray.

## JUNCTION BOX HOLDER

An aluminum treadbrite bracket shall be provided to hold the cord reel junction box.

## CORD REEL ROLLER ASSEMBLY WITH BALL STOP

A roller assembly with ball stop shall be provided for the cord reel(s). The assembly shall be mounted in a location that will help deflect the cable/hose from the surfaces adjacent to the reel.

## **CORD REEL INFORMATION LABEL - NFPA**

A label shall be permanently attached adjacent to the cord reel displaying the following information:

- Current rating.
- Current type.
- Phase.
- Voltage.
- Total cord length.

## **POWER SOURCE SPECIFICATION LABEL - NFPA**

A label shall be permanently attached to the apparatus near the operator's control panel. The label shall provide the operator with the following information:

Continuous Duty Rating	
In watts	
Single or three	
Hertz	
Amps	
Watts	
RPM	

## POWER SOURCE INSTRUCTIONAL LABEL - NFPA

A label shall be permanently attached at any location on the apparatus that the AC power source may be activated. The label shall provide the operator with essential power source operating instructions including the power-up and power-down sequence.

## **NFPA GENERATOR SYSTEM TESTING**

The generator and related electrical components shall be tested to NFPA 1901 22.15 requirements. Documentation of the tests shall be provided with the completed apparatus.

#### 120/240 VOLT ELECTRICAL EQUIPMENT INSTALLATION

All 120/240-volt electrical equipment shall be installed by the apparatus manufacturer. This shall include any item related to the system, including, but not limited to the following:

- Generator.
- All scene lighting accessories.
- All outlets, and cord reels (where applicable)
- Breaker panel.

To maintain the integrity of the entire apparatus electrical system, all 120/240-volt equipment must be installed by the apparatus manufacturer. Installation by the apparatus manufacturer will also allow the electrical system to be NFPA tested during the U.L. Aerial certification testing procedure.

Installation of any portion of the 120/240-volt system by a dealer or service center will not be acceptable. <u>There</u> shall be no exception to this requirement.

#### **120/240 GENERATOR FAMILIARIZATION**

Familiarization of the apparatus shall include the following items related to the generator system:

- Proper engagement (if driven by the chassis).
- Start up, operation and shut down of the generator.
- Monitoring of controls and instruments.

## **LETTERING**

The apparatus dealer shall provide and apply all vehicle lettering and numbering.

#### NFPA REFLECTIVE STRIPE - DEALER SUPPLIED/INSTALLED

The reflective stripe necessary on the sides, front and rear of the apparatus shall be provided and applied by the apparatus dealer.

#### STATEMENT OF EXCEPTION - NFPA REQUIRED REFLECTIVE STRIPPING

As the dealer shall be installing the NFPA required reflective stripping to the apparatus, the dealer and the customer shall be responsible for insuring that the stripping and the layout is installed properly and complaint to NFPA 1901 15.9.3.

#### AERIAL SIGNBOARDS

A signboard shall be provided on each side of the aerial for mounting of large scale lettering. The board shall be finish painted. The area of the board that is useable for application of identification letters shall be 132" long x 14" high.

#### **AERIAL SIGNBOARD LETTERING**

The apparatus dealer shall provide and apply all aerial signboard lettering and numbering.

#### **REAR CHEVRON STRIPING**

A minimum of 50 percent of the rear vertical surface of the apparatus body metal surface shall be covered with 6 inch alternating red and yellow retro-reflective striping. The striping shall slope downward away from the centerline of the apparatus at a 45-degree angle.

The retro-reflective material shall conform to the requirements of ASTM D 4956 "Standard Specification for Retro-Reflective Sheeting for Traffic Control", Type I or better.

#### "AS BUILT" APPARATUS BODY OWNERS MANUALS (2)

Two "as built" apparatus body owner's manual USB drives shall be provided with the apparatus. All apparatus body electrical schematics shall be provided as well as all instructional and maintenance manuals on components provided and permanently mounted on the apparatus. A copy of the final apparatus body build specifications shall also be included on the drive. The USB shall be "read only" and shall not allow modification.

To eliminate component confusion, generic documentation with equipment that is not provided on the apparatus body shall not be acceptable.

#### FAMA FIRE APPARATUS SAFETY GUIDE

One (1) FAMA Fire Apparatus Safety Guide(s) shall be provided with the completed apparatus.

#### STATEMENT OF EXCEPTION - NFPA MISCELLANEOUS REQUIRED EQUIPMENT

The customer shall be responsible for providing all NFPA required miscellaneous equipment that is not contained within these specifications. All required equipment must be properly installed on the apparatus and in working condition prior to the apparatus being placed into service.

## FAMILIARIZATION AND DEMONSTRATION

Upon completion of the new apparatus, an authorized properly trained representative of the manufacturer shall perform a "Familiarization and Demonstration" overview of the apparatus and related components.

The Department shall provide the representative with a written list, by full proper names, of the individual(s) that are to receive the overview. Upon completion of the overview, each person in attendance will be required to acknowledge, by signature, that they understand the operation of the apparatus and all related components.

## CHASSIS FAMILIARIZATION

Familiarization of the apparatus shall include the following:

- How to locate gauges or indicators and check all fluid levels and operational use of the apparatus.
- How to tilt the chassis cab or hood assembly for access to the engine, fire pump (if applicable), or aerial control (if applicable), or any other device to allow access to fluids or for required maintenance.
- Interior cab controls, instruments, mirrors, safety devices or alarms, brake operations, transmission control, pump controls (if applicable) exhaust regeneration (if applicable), seat adjustments, warning light engagement and other operational equipment.

## POST ACCEPTANCE TRAINING REQUIREMENTS

After apparatus acceptance, the Department shall be responsible for ongoing training of personnel. The Department shall not allow untrained or undertrained personnel to operate the apparatus or any included feature of the apparatus.

## FRONT BUMPER APRON

A flat stainless-steel front bumper apron shall be provided and installed.

## 6,000 PSI 4 CYLINDER CASCADE SYSTEM

A 6,000 psi 4-cylinder cascade system shall be properly secured to the apparatus. All necessary hoses and fittings shall be provided to allow "banking" of the cascade system.

## SPACE-SAVER 100A FILL ENCLOSURE

A Space Saver model 100A two-cylinder fill station enclosure shall be provided and incorporated into the apparatus body. The fill station shall be fully enclosed and designed for mobile applications. The enclosure shall be designed to contain an SCBA cylinder and metal fragments in the event of rupture during the fill process.

The enclosure shall be designed to rapidly vent expanding air caused by a cylinder failure. The vent shall be through a body floor opening. The fill station shall be designed to allow the filling of two SCBA cylinders either separately or simultaneously. Access to the enclosure for loading the SCBA cylinders shall be via a manually operated slide up and a tilt out bottle holder. The door shall be provided with an assisting device to assure smooth operation and reduced operator fatigue.

To insure operator protection, automatic safety interlocks that prevent SCBA cylinder filling until the door is completely closed shall be supplied. Two fill hoses with SCBA adapters shall be provided and located within the enclosure. A bottom rubber seal shall be provided to seal out road dirt. A polypropylene base plate shall be provided in the bottom perimeter footprint to frame in the rubber seal and protect from dissimilar metal corrosion to the body.

The fill enclosure shall be 43" high x 13" wide (not including fill panel) x 23 1/4" deep and shall weigh 400 lbs.

## **RESOLVE SPECIALTY ACCUFLO AIR CONTROL PANEL**

A Resolve Specialty Products Standard AccuFlo Air Control four bank fill panel shall be provided on the apparatus. The panel shall include the following features:

- Color coded graphics for simplified operation
- High pressure Thermo valves
- Premium pressure gauges
- Tilt design for maintenance
- High pressure regulator for SCBA cylinder fill
- Regulated relief valve/gauge
- Pioneer 3000 refill fitting with bleed valve

A connecting hose shall be provided from the fill panel to the fill station.

#### **CASCADE SYSTEM/FILL PANEL MOUNTING LOCATION**

The cascade system shall be mounted above the torque box forward of the turn table. A red vinyl cover shall be provided.

The fill panel and fill enclosure shall be mounted in the compartment in front of the wheels on the left side.

## BREATHING AIR SYSTEM CERTIFICATION

The following certifications shall be provided for the air system:

- Air cylinder certification per NFPA 1901 24.5.1.2.
- Fill station certification per NFPA 1901 24.9.6.
- Air system installation test per NFPA 1901 24.15.5 and 24.15.4.

#### **2 LB. BAG OF FASTENERS**

A 2 lb. bag of fasteners used in the final assembly of the apparatus shall be provided. The bag shall contain a variety of fasteners and shall not be one single size.

#### ZIAMATIC SAC-44 ALUMINUM WHEEL CHOCKS

One (1) set(s) of two Zico SAC-44 folding wheel chocks shall be provided. Two "underbody" horizontal brackets (per set) shall be provided.

The wheel chocks shall be mounted under the driver's side front compartment.

#### EQUIPMENT AND LETTERING

Door Lettering "WATERTOWN" in arch with #1 below - 3" gold scotchcal with dark blue shade and light blue opposite outline

- 18 Aerial sign board lettering WATERTOWN Red Reflective with black shade and border 12"
- 1 NFPA stripe White .5" x 4" x .5" hockey stick on body
- 2 Watertown Door seals
- 2 American Flags upper doors above front outriggers
- 1 Keep Back 500 Feet sign -
- 9 "Watertown" above front grille 2.5" Gold Leaf Scotchcal with dark blue shade and light blue opposite outline

- 4 "T2" front cab corners 3" gold ScotchCal with dark blue shade and light blue opposite outline
- 1 Leatherhead PLY 8AH-8 pike pole with butt end
- 216 Turtle Tile 1212BLKPR compartment / Shelf tiles installed
- 40 Turtle tile AM Yellow tile edges installed
- 1 Radio install of FD supplied radios
- 1 Equipment bracket and mounting allowance \$ 15,000.00

## TOWN OF WATERTOWN

#### WATERTOWN, CONNECTICUT 06795

## **BID PROPOSAL**

## Watertown Fire Department

#### Fire Apparatus –BID OPENING: 11:00 a.m. Monday, March 27, 2023

TO: Donna L. Ford, Purchasing Agent Town of Watertown Town Hall 61 Echo Lake Road Watertown, CT 06795

The undersigned, as bidder, agrees to furnish and deliver one (1) 110' Rear Mount Aerial Ladder Truck and declares that no person or persons, other than those named herein, are interested in this Proposal; that this Proposal is made without collusion with any person, firm, or corporation; that he has carefully examined the location of the proposed work; that no person or persons acting in any official capacity for the Town is directly or indirectly interested therein or in any portion of the profit thereof; and that he proposes and agrees, if this Proposal is accepted, to execute the Form of Contract with the Town; to provide all necessary equipment, tools, labor and delivery and to do all work and furnish all materials specified in the manner and time therein prescribed, and according to the requirements of the Town as therein set forth, and that he will take in full payment therefor, the following unit prices and lump sums, to wit:

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## PROPOSAL

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## **EXCEPTIONS TAKEN TO SPECIFICATIONS:**

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# **RECEIPT OF ADDENDA**

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### **REFERENCES**

### Please list a minimum of three references of similar work performed within the last three years.

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### BID BOND

KNOW ALL MEN BY THESE PRESENTS, that we, the undersigned, \_\_\_\_\_

as Principal,	and as
Surety, are hereby held and firmly bound unto	as OWNER in the
penal sum of	for the payment of which, well and
truly to be made, we hereby jointly and severally	bind ourselves, successors and assigns. Signed, this
day of, 20	The Condition of the above obligation is such that
whereas the Principal has submitted to	a certain BID,
attached hereto and hereby made a part here	eof to enter into a contract in writing, for the

NOW, THEREFORE,

- (a) If said BID shall be rejected, or
- (b) If said BID shall be accepted and the Principal shall execute and deliver a contract in the Form of Contract attached hereto (properly completed in accordance with said BID) and shall furnish a BOND for his faithful performance of said contract, and for the payment of all persons performing labor or furnishing materials in connection therewith, and shall in all other respects perform the agreement created by the acceptance of said BID,

then this obligation shall be void, otherwise the same shall remain in force and effect; it being expressly understood and agreed that the liability of the Surety for any and all claims hereunder shall, in no event, exceed the penal amount of this obligation as herein stated.

The Surety, for value received, hereby stipulates and agrees that the obligations of said Surety and its BOND shall be in no way impaired or affected by any extension of the time within which the OWNER may accept such BID; and said Surety does hereby waive notice of any such extension.

IN WITNESS WHEREOF, the Principal and the Surety have hereunto set their hands and seals, and such of them as are corporations have caused their corporate seals to be hereto affixed and these presents to be signed by their proper officers, the day and the year first set forth above.

Principal

\_\_\_\_(L.S.)

Surety

By:\_\_\_\_\_

IMPORTANT - Surety companies executing BONDS must appear on the Treasury Department's most current list (Circular 570 as amended) and be authorized to transact business in the state where the project is located.

## PERFORMANCE BOND

#### KNOW ALL MEN BY THESE PRESENTS: that

(Name of Contractor)
(Address of Contractor)
a \_\_\_\_\_\_, hereinafter called Principal and
(Corporation, Partnership, or Individual)
(Name of Surety)
(Address of Surety)
hereinafter called Surety, are held and firmly bound unto
(Name of Owner)
(Address of Owner)
(Address of Owner)

hereinafter called OWNER, in the penal sum of \_\_\_\_\_\_ Dollars, \$(\_\_\_\_\_\_) in lawful money of the United States, for the payment of which sum well and truly to be made, we bind ourselves, successors, and assigns, jointly and severally, firmly by these presents.

**THE CONDITION OF THIS OBLIGATION** is such that whereas, the Principal entered into a certain contract with the OWNER, dated the \_\_\_\_\_ day of \_\_\_\_\_, 20\_\_\_, a copy of which is hereto attached and made a part hereof for the construction of:

**NOW, THEREFORE**, if the Principal shall well, truly and faithfully perform its duties, all the undertakings, covenants, terms, conditions, and agreements of said contract during the original term thereof, and any extensions thereof which may be granted by the OWNER, with or without notice to the Surety and during the one year guaranty period, and if he shall satisfy all claims and demands incurred under such contract, and shall fully indemnify and save harmless the OWNER from all costs and damages which it may suffer by reason of failure to do so, and shall reimburse and repay the OWNER all outlay

and expense which the OWNER may incur in making good any default, then this obligation shall be void; otherwise to remain in full force and effect.

**PROVIDED, FURTHER**, that the said surety, for value received hereby stipulates and agrees that no change, extension of time, alteration or addition to the terms of the contract or to WORK to be performed thereunder or the SPECIFICATIONS accompanying the same shall in any wise affect its obligation on this BOND, and it does hereby waive notice of any such change, extension of time, alteration or addition to the terms of the contract or to the WORK or to the SPECIFICATIONS.

**PROVIDED, FURTHER**, that no final settlement between the OWNER and the CONTRACTOR shall abridge the right of any beneficiary hereunder, whose claim may be unsatisfied.

**IN WITNESS WHEREOF**, this instrument is executed in \_\_\_\_\_ counterparts each one of which shall be deemed an original, this \_\_\_\_\_ day of \_\_\_\_\_\_, 20\_\_.

ATTEST:	
	Principal
(Principal) Secretary (SEAL)	By(s)
(Witness as to Principal)	(Address)
(Address)	
ATTEST:	Surety
(Surety) Secretary (SEAL)	
(Witness as to Surety)	By Attorney-in-Fact
(Address)	(Address)
	I

Date of BOND must not be prior to date of Contract.

If CONTRACTOR is Partnership, all partners should execute BOND

IMPORTANT: Surety companies executing BONDS must appear on the Treasury Department's most current list (Circular 570 as amended) and be authorized to transact business in the state where the PROJECT is located.

## PAYMENT BOND

#### KNOW ALL MEN BY THESE PRESENTS: that

(Name of Contractor)

(Address of Contractor)

a \_\_\_\_\_\_\_, hereinafter called Principal and
(Corporation, Partnership, or Individual)

(Name of Surety)
(Address of Surety)
hereinafter called Surety, are held and firmly bound unto

(Name of Owner)

(Address of Owner)

hereinafter called OWNER, in the penal sum of \_\_\_\_\_\_ Dollars, \$(\_\_\_\_\_) in lawful money of the United States, for the payment of which sum well and truly to be made, we bind ourselves, successors, and assigns, jointly and severally, firmly by these presents.

THE CONDITION OF THIS OBLIGATION is such that whereas, the Principal entered into a certain contract with the OWNER, dated the \_\_\_\_\_ day of \_\_\_\_\_, 20\_\_\_, a copy of which is hereto attached and made a part hereof for the construction of:

NOW, THEREFORE, if the Principal shall well, truly and faithfully perform its duties, all the undertakings, covenants, terms, conditions, and agreements of said contract during the original term thereof, and any extensions thereof which may be granted by the OWNER, with or without notice to the Surety and during the one year guaranty period, and if he shall satisfy all claims and demands incurred under such contract, and shall fully indemnify and save harmless the OWNER from all costs and damages which it may suffer by reason of failure to do so, and shall reimburse and repay the OWNER all outlay

and expense which the OWNER may incur in making good any default, then this obligation shall be void; otherwise to remain in full force and effect.

PROVIDED, FURTHER, that the said surety, for value received hereby stipulates and agrees that no change, extension of time, alteration or addition to the terms of the contract or to WORK to be performed thereunder or the SPECIFICATIONS accompanying the same shall in any wise affect its obligation on this BOND, and it does hereby waive notice of any such change, extension of time, alteration or addition to the terms of the contract or to the WORK or to the SPECIFICATIONS.

PROVIDED, FURTHER, that no final settlement between the OWNER and the CONTRACTOR shall abridge the right of any beneficiary hereunder, whose claim may be unsatisfied.

IN WITNESS WHEREOF, this instrumen	nt is executed in counterparts each one of which	ch shall be
deemed an original, this day of	, 20	
ATTEST:		
	Principal	
	By(s)	
(Principal) Secretary		
(SEAL)	(Address)	_
(Witness as to Principal)		_
(Address)		
ATTEST:		
	Surety	
	By	(Surety)
Secretary	Attorney-in-Fact	
(SEAL)		
(Witness as to Surety)	(Address)	
(Address)		

NOTE: Date of BOND must not be prior to date of Contract. If CONTRACTOR is Partnership, all partners should execute BOND

IMPORTANT: Surety companies executing BONDS must appear on the Treasury Department's most current list (Circular 570 as amended) and be authorized to transact business in the state where the PROJECT is located.