SPECIFICATIONS
AND
BID DOCUMENTS

Bid Number 2025-010
Fire Fighting Apparatus

Office of the First Selectman

501 Main Street South

Southbury, CT

October 29, 2025

Invitation to Bid

Fire Fighting Apparatus

The Town of Southbury (The Town/Purchaser) will accept **sealed** bids for a Fire Fighting Apparatus for the Southbury Volunteer Firemen's Association.

Bids will be accepted at the Office of the First Selectman, 501 Main Street South, Southbury, CT 06488 until 2 p.m. on December 2, 2025.

All bids *must* include one hard copy and a flash drive with complete bid package enclosed.

Specifications and bidding documents may be obtained electronically from the Town's website at www.southbury-ct.org/bids.

Prospective bidders shall examine the "Instructions for Bidders" and shall comply and conform strictly to the conditions and instructions contained therein.

The Town reserves the right to reject any and all bids and to accept the bid deemed to be in the best interest of the Town of Southbury.

Instructions to Bidders
Separate sealed bids will be received in the Office of the First Selectman, Town Hall, 501 Main Street South, Southbury, Connecticut, 06488, until the time and date stated in the **INVITATION TO BID.**

All bids shall be submitted in sealed, opaque envelopes clearly labeled with the name of the bidder, his address, and the words **"BID DOCUMENTS, Fire Fighting Apparatus"** so as to guard against opening prior to the time set therefore.

Bids may be forwarded by mail. If mailed, the sealed opaque envelope containing the proposal, marked as described above, shall be enclosed in another envelope properly addressed for mailing.

The Town may consider informal any bid not prepared and submitted in accordance with the provisions hereof and may waive any informalities in or reject any and all bids.

Sealed bids must be received at the Office of the First Selectman by 2:00 pm on December 2, 2025, 501 Main Street South, Southbury, CT. 06488.
Questions about this bid should be directed to the Southbury Volunteer Fireman's Association *via email only*, svfarescue@gmail.com until November 12, 2025.

Preparation of Proposal
Each bid must be submitted on the prescribed form and all blank spaces for bid prices must be filled, handwritten in ink or type written, in both words and figures. Bid prices shall include all labor, materials, and equipment necessary to complete the work in accordance with the bid documents. All bid prices must remain effective for 45 days from bid opening. Apparatus must be new and current year of manufacture.

CONTRACT CONSIDERATIONS
EQUAL OPPORTUNITY – AFFIRMATIVE ACTION
The successful firm shall comply in all aspects with the Equal Employment Opportunity Act. A firm with 15 or more employees shall be required to have an Affirmative Action Plan that declares that the Contractor does not discriminate based on race, color, religion, sex, national origin, or age, which specifies goals target dates to assure the implementation of equal employment. A firm with fewer than 15 employees shall be required to have a written equal opportunity policy statement declaring that it does not discriminate based on race, color, religion, sex, national origin, or age.
Findings of noncompliance with applicable State and Federal equal opportunity laws and regulations could be sufficient reason for revocation or cancellation of this contract.

INDEMNIFICATION
The awarded firm agrees to indemnify, defend, and save harmless, the Town of Southbury, as well as its officers, agents, and employees from any and all claims and losses to the extent caused by the negligent act, error, or omission of the awarded firm

resulting from the performance of this contract, except to the extent caused by the negligent acts of the Town of Southbury or its officers, agents or employees.

The Town, as a sovereign government, cannot indemnify businesses or individuals.

INSURANCE

Commercial General Liability Insurance

Prior to the execution of any contract, the Town of Southbury requires that any awarded contractor providing materials, equipment, or services to the Town must provide to the Town a certificate of insurance (Acord or other approved format) naming the Town of Southbury as additional insured, for the following:

- Each bidder shall supply proof of product liability and facility insurance equal to or exceeding $5,000,000. This shall be provided as part of the proposal.
- General liability (including completed operations coverage) in the amounts of $1,000,000 (combined single limit) Bodily Injury/Property Damage coverage per occurrence and $2,000,000 general aggregate coverage.
- Automobile Liability in the amount of $1,000,000 (combined single limit), Property Damage, and Bodily Injury coverage.
- Professional Liability, in an amount not less than $500,000.00 per occurrence and $1,000,000.00 aggregate.
- Worker's Compensation as defined in the Connecticut General Statutes.

Any subcontractor to a contracted firm shall be likewise covered and shall furnish certificates of coverage acceptable to the Town before starting work.
The awarded firm shall maintain professional liability insurance until the expiration of the statute of limitations. In the event there is no statute of limitations specifically applicable to this project, the awarded firm shall maintain coverage for a reasonable period after the date of substantial completion of the project as agreed to by the Town and the awarded firm.

Bid Bond

A bid bond will be submitted with the bidder's proposal. The bond will be for an amount equal to 10% of the proposed bid price. Failure to provide an acceptable, valid bid bond with the proposal will result in the immediate rejection of the bidder's proposal.

Familiarity with Laws, Site Conditions, and Documents

Each bidder is required to be familiar with and to comply with the terms and conditions of the specifications and all other Bid documents and with all Federal, State and Local laws, ordinances or regulations, which in any manner relate to the furnishing of the services in accordance with the Bid.
Each bidder shall thoroughly familiarize himself with all conditions of the bid documents and specifications before preparing his proposal. The submission of a proposal shall be construed as an assurance that such examination has been made and the failure of the bidder to familiarize himself with conditions relating to the specifications shall in way relieve any bidder from any obligation in respect to his bid.

Errors, Interpretations, and Addenda

Should a bidder find any omissions, discrepancies, or errors in the specifications or other Bid Documents or should he be in doubt as to the meaning of the Specifications or other Bid Documents, he should immediately notify the Town who may correct, amend, or clarify such documents by a written interpretation or addendum. No oral interpretations shall be made to any bidder and no oral statement of the Town shall be effective to modify any of the provisions of the Bid Documents.

INVOICING AND PAYMENT

Standard payment terms are Net 30 Days from receipt of properly executed invoice(s). If your firm submits a proposal that includes payment schedules based on the completion of designated phases, those stages must be clearly outlined in your proposal. The Town cannot make payments for "execution of contract" (payments due upon contract signing). The Town is tax-exempt and shall not be charged tax.

AWARD CONSIDERATIONS

The Town may reject any or all proposals or submittals for such reason as it may deem proper. In acceptance of proposals or submittals, the Town will be guided by consideration of the interests of the Town. The Town also reserves the right to negotiate further with one or more of the firms as to any features of their proposals or submittals and accept modifications of the work and price when such action will be in the Town's best interests.

Firms selected for an interview will be provided with the interview panel's content; the selected firms will be required to submit affidavits relating to their relationship(s) with members of the panel. The names of interview committee members will be released solely for the purpose of preparation of affidavits; the selected firms shall not directly contact the panel members prior to immediately following the interview process.

The individual signing this submittal hereby declares that no person or persons other than members of his/her own organization are interested in this project or in the contract proposed to be taken; that it is made without any connection with any other person or persons making a proposal for the same work and is in all respects fair and without collusion or fraud; that no person acting for or employed by the Town of Southbury is directly or indirectly interested therein, or in the supplies or works to which it relates or will receive any part of the profit or any commission therefrom in any manner which is unethical or contrary to the best interests of the Town of Southbury.

Unless otherwise noted within a proposal, proposals received in response to this document, including proposed fee schedules, are assumed valid and binding for one hundred and twenty (120) days from receipt of the proposal. If an award is not made within such time, the proposal can be deemed to be either no longer valid or can be extended with the mutual consent of the Town and the firm submitting the proposal. Documents/reports/data become the property of the Town of Southbury.

Town of Southbury
Bid # 2025-010
Fire Fighting Apparatus

Due Date: 2:00 p.m., December 2, 2025

Town of Southbury
First Selectman Jeffrey Manville
501 Main Street South
Southbury, CT 06488

In accordance with the Town's requirements, the undersigned agrees to provide services as defined herein.
The undersigned is familiar with the conditions surrounding this Request for Proposal/Bid, is aware that the Town reserves the right to reject any and all proposals, and is making submission without collusion with any other person, individual, or corporation.

Company Name: _____

Address: _____

_____

Email Address: _____

Telephone #: _____

Federal Tax ID #: _____

Signature: _____

Printed Name: _____

Title: _____

Date: _____

BID PROPOSAL
TOWN OF SOUTHBURY
Fire Fighting Apparatus

TO:

Mr. Jeff Manville
First Selectman
501 Main Street South
Southbury, Connecticut 06488

PROPOSAL OF:

NAME OF COMPANY_____

ADDRESS: _____

CITY STATE ZIP_____

TELEPHONE_____

EMAIL_____

Fire Fighting Apparatus, in accordance with the attached specifications, at the

Lump Sum Price of: $ _____

TOTAL PRICE IN WORDS

_____

_____Dollars_____Cents

We will order the vehicle within _____days after notice to proceed or signing of a

Contract and deliver the vehicle within _____calendar days.

Signature of Authorized Company Official/Representative

_____

Name_____

Title_____

Date_____

NOTICE TO CONTRACTORS
CODE OF ETHICS/CONFLICT OF INTEREST ORDINANCE

The Town of Southbury has a Code of Ethics/Conflict of Interest Ordinance. The Contractor shall comply with all applicable provisions of said Ordinance. The Contractor acknowledges receiving a copy of said Ordinance, a copy of which is attached hereto and made a part hereof. The Contractor further agrees that any instance of its violating any provisions of the Code of Ethics/Conflict of Interest Ordinance will be sufficient cause for the Town to terminate any or all of the Contractor's contracts or pending contracts with the Town. The Contractor agrees that the above clause will also be incorporated in all of its contracts with its subcontractors and consultants.

ACKNOWLEDGEMENT OF RECEIPT

I have read the above Code of Ethics/Conflict of Interest Ordinance and agree to abide by its terms. (Shown below)

ORDINANCE RECEIVED BY _____ (Print name)

_____ (Signature)

_____ (Date)

Code of Ethics/Conflict of Interest Ordinance

A. Definitions.

The following definitions shall apply to this Ordinance:

1. **Public Official** (or Public Office). An elected or appointed official, whether paid or unpaid, full or part-time, of the Town of Southbury. This includes being a member or alternate member of any board, committee, commission or agency that exists in the Town of Southbury government.

2. **Town Employee** (or Town Employment). A paid employee, full or part-time, of the Town of Southbury.

3. **Ethics Commission.** The Town of Southbury Commission on Ethics as authorized by Section 7-148h of the Connecticut General Statutes.

4. **Conflict of Interest.** A conflict of interest shall be deemed to exist if any Public Official or Town Employee has a Direct Interest or an Indirect Interest, in any purchase, contract, transaction, or decision involving his/her office, board, commission, agency or employment.

5. **Direct Interest.** An interest of a Public Official or Town Employee or any business, investment, or property in which such Public Official or Town Employee is an owner, member, partner, officer, employee or stockholder or has any other form of

participation, that is a Financial Interest or an Adverse Interest in any purchase, contract, transaction or decision involving his or her office, board, committee, commission, agency or employment.

6. **Indirect Interest.** An interest of a family member within the fourth degree by blood or marriage or a person engaged in a close business relationship with a Public Official or Town Employee in any purchase, contract, transaction or decision involving the Public Official's or Town Employee's office, board, committee, commission, agency or employment which, if held by the Public Official or Town Employee directly, would meet the definition of a Direct Interest.

7. **Financial Interest.** A Financial Interest shall be deemed to exist if a person or entity with a Direct Interest or an Indirect Interest as defined herein might, directly or indirectly, derive pecuniary or financial gain or suffer loss from any Town purchase, contract, transaction, decision or employment.

8. **Adverse Interest.** An interest that is adverse to the interests of the Town with respect to the matter under consideration.

9. **Material Conflict of Interest.** A conflict of interest shall be deemed to be material where a reasonable person would conclude that a Financial Interest or Adverse Interest:

a. is incompatible, or would to a reasonable person appear to be incompatible, with the proper discharge of official duties; or

b. would tend to impair, or would to a reasonable person appear to impair, independence of judgment and action in the performance of official duties.

B. Declaration of Policy.

1. The proper operation of the government of the Town of Southbury requires that Public Officials and Town Employees be independent, impartial and responsible to the people; that governmental decisions and policies be made in the proper channels of the government structure and free from coercive or other improper influence; that Public Officials and Town Employees not use their positions for personal gain; and that the general public have confidence in the integrity of its government.

2. This Ordinance sets forth standards of ethical conduct to maintain and enhance responsible and effective public service by our Public Officials and Town Employees in the performance of their duties.

3. In the interest of ensuring that concerns regarding possible conflict of interests are promptly raised, this Ordinance permits a concern that a conflict of interest may exist to be raised by any person, regardless of whether the person would be considered an aggrieved party as that term is interpreted under Connecticut law. Any failure to observe the procedures set forth in this Ordinance shall not, however, afford a basis for an action for damages against the Town, any Town board, committee, commission, agency or employee, or any member of any Town board , committee, commission, or agency, or for challenging a decision, license, permit or other action of a Town

Employee, board, committee, commission or agency or member of same by a person who would not, but for the provisions of this Ordinance, have standing to bring such an action.

C. Disclosure of Conflict.

1. Any Public official or Town Employee who has a conflict or potential conflict of interest as defined herein, whether or not such conflict or potential conflict is material, shall disclose the interest causing such conflict or potential conflict in writing to the Board of Selectmen.

2. Any Public Official or Town Employee who is a member of any Town board, committee, commission or agency who has a conflict or potential conflict of interest as defined herein, whether or not such conflict or potential conflict is material, shall, in addition to the disclosure required by this Ordinance, disclose the interest causing such conflict to such board, committee, commission, or agency and such disclosure shall be recorded in the board's, committee's, commission's or agency's minutes.

D. Determination of Materiality.

1. In the event that a disclosure or a claim of a conflict of interest with respect to any Public Official or Town Employee has been made to the Ethics Commission, and the Public Official or Town Employee does not disqualify himself/herself from matters with respect to which the conflict of interest allegedly exists, the Ethics Commission shall promptly inquire into the facts of the matter and determine whether or not a conflict exists and if so, whether it is material.

2. In the event that a disclosure or a claim or a conflict of interest with respect to any Public Official or Town Employee who is a member of a Town board, committee, commission or agency has been made to such board, committee, commission, or agency and the member does not disqualify himself/herself from matters with respect to which the conflict of interest allegedly exists, the board, committee, commission or agency shall forthwith determine by a majority of those members present, excluding the member whose interest is in question, whether or not a conflict exists and, if so, whether it is material.

E. Disqualification.

If it has been determined that a material conflict of interest exists, the Public Official or Town Employee who has the conflict shall be disqualified from discussing or acting upon any matter encompassed by that conflict of interest, and shall leave the room during any public hearing, discussions or deliberations regarding the matter. Any Public Official or Town Employee may disqualify himself/herself even though the conflict of interest is not material.

F. Claim of Conflict.

If a formal written complaint is made to the Ethics Commission that any Public Official or Town Employee has an undisclosed conflict of interest, the Ethics Commission shall record and act upon the claim in accordance with its procedures as outlined in Section J.

G. Gifts and Favors.

No Public Official or Town Employee shall accept or receive, directly or indirectly, anything of value (whether by rebate, gift, promise, obligation or contract for future reward or compensation or otherwise) for awarding or influencing the award of any decision, permit, license, contract or purchase order by the Town. Anything of value when in the form of a gift shall not be deemed relevant if the actual cost of that item is less than $25.00.

H. Representation.

1. Without the prior written consent of the Ethics Commission, no Public official or Town Employee shall appear for compensation, except on behalf of the town, before any Town board or agency in which he/she was formerly employed or served as an official at any time within a period of one (1) year after termination of his/her service with the Town.

2. Without the prior written consent of the Ethics Commission, no current or former Public Official or Town Employee shall represent anyone other than the Town concerning any particular matter in which he/she participated personally and substantially while in municipal service.

3. No current or former Public Official or Town Employee shall disclose or use confidential information acquired in the course of and by reason of his/her official duties, for personal and/or financial gain for himself/herself or others.

4. No former Public Official or Town Employee who participated substantially in the negotiation or award of municipal contract or who supervised the negotiation or award of such a contract shall accept employment with a party to the contract other than the Town for a period of one (1) year after such contract is signed.

I. Independent Contractors.

Before hiring any consultant, independent contractor or other advisor, the Public Official, Town Employee, board, committee, commission or agency that proposes to hire the independent contractor shall inquire whether the independent contractor has any conflict of interest as that term is defined in this Ordinance or as defined in any code of ethics or similar code applicable to the independent contractor. Any such conflict shall be specified in the appropriate Town records (such as minutes of any relevant board, committee, commission, or agency). Prior to hiring any independent contractor with a conflict, the Public Official, Town Employee, board, committee, commission or agency proposing to hire the independent contractor must make a determination that the conflict is not material and/or that despite the conflict, the independent contractor should be hired. The decision and the reasons therefore must be a matter of public record.

No consultant, independent contractor or other advisor of the Town shall represent a private interest in any action or proceeding against the interest of the Town, which is in conflict with the performance of his/her duties as such, consultant, independent contractor, or advisor. No consultant, independent contractor, or advisor may

represent anyone other than the Town concerning any matter in which he/she participated personally and substantially as a consultant to the Town. Neither shall such consultant, independent contractor or advisor disclose confidential information acquired while performing his/her duties for the Town, nor shall he/she use such information for the personal and/or financial interests of himself/herself or others.

J. Procedure.

All claims pertaining to a violation of this Ordinance shall be made, in writing, to the Ethics Commission in accordance with the rules and regulations promulgated by that Commission which shall be found in the Town of Southbury Ethics Commission Statement of Procedures. These rules shall require the Complainant to specify the facts that gave rise to his/her claim and the specific provision of this Ordinance that has been breached on a Form provided by the Ethics Commission. The Ethics Commission may, but is not required to consider claims made against individuals who are former Public Officials or Town Employees.
Any allegations and any information learned, supplied to, or received from or by the Ethics Commission shall remain confidential until a finding of Probable Cause is determined by the Ethics Commission.

The Ethics Commission is authorized to issue advisory opinions at its discretion.

K. Penalties.

1. Any person who violates any of the provisions of this Ordinance may be censured or reprimanded or may be suspended or removed from Public Office or Town Employment, as the case may be, in the manner provided by law as recommended by the Ethics Commission with action by the Board of Selectman.

2. Any violation of this Ordinance shall render any purchase, contract, or transaction or any part thereof affected thereby voidable as recommended by the Ethics Commission with action by the Board of Selectmen.

3. Any violation of this Ordinance with respect to any decision of a board, committee, commission, or agency shall be subject to any remedies deemed proper as recommended by the Ethics Commission with action by the Board of Selectmen and permitted by law.

4 The penalties provided above are in addition to any other penalties provided by law to address violations of the provisions of this Ordinance.

L. Concurrent Offices.

1. No Town Employee shall serve on any board, committee, commission or agency to which the Town Employee reports or acts as staff, except as otherwise stated in the Town Charter or Ordinances. Notwithstanding the foregoing, a Town Employee may serve on any board, committee, commission, or agency in an advisory capacity.

2. Except as otherwise provided in the Charter or by Ordinance, the First Selectman, the Selectmen, the Town Clerk, members of the Board of Finance and members of the Ethics Commission shall hold no other Public Office, and the provisions of Section 9-

210 of the General Statutes concerning incompatible Town offices shall apply to the officers described therein.

3. The restrictions set forth in Section L. 1 and Section L. 2 shall not apply to membership on any temporary or advisory only committee, task force, working group, or the like.

4. Subject to the restrictions set forth in applicable law, or by the Charter or by Ordinance, and in Section L. 2 of this Ordinance, nothing in this Ordinance shall prevent the appointment of the same person to more than one Public Office, provided the offices are not incompatible, provided the duties of the offices to which he/she is appointed may, in the opinion of the Ethics Commission, be satisfactorily fulfilled by one person, and provided further that inability to fulfill satisfactorily the duties of all offices to which he is appointed shall be cause for removal from any one or more of said offices.

M. Meetings.

1. Members Attendance. Public Officials who are members of boards, committees, commissions, and agencies are expected to attend all meetings of such boards, committees, commissions, and agencies or attend meetings in accordance with the by-laws or other duly adopted rules of the group to which they belong. However, it shall not be deemed to be a violation of this Ordinance if Public Officials who are members of boards, committees, commissions, and agencies comply with the standards set forth in Section 512 of the Town Charter. For the purposes of this Ordinance only, the attendance standards set forth in Section 512 shall apply to both elected and appointed members of boards, committees, commissions, and agencies.

2. Alternates' Attendance. Public Officials who are alternate members of boards, committees, commissions, and agencies are expected to attend all meetings of such boards, committees, commissions and agencies, or attend meetings in accordance with the by-laws or other duly adopted rules of the group to which they belong.. However, it shall not be deemed to be a violation of this Ordinance if Public Officials who are alternate members of boards, committees, commissions, and agencies comply with the standards set forth in Section 512 of the Town Charter. For the purposes of this Ordinance only, the attendance standards set forth in Section 512 shall apply to both elected and appointed alternate members of boards, committees, commissions, and agencies.

3. Voting. All Public Official members or seated alternate members of boards, committees, commissions and agencies who are qualified to vote, shall vote on all matters upon which a vote is held by such board, committee, commission or agency unless there shall be reasonable cause for abstention and said cause is stated and recorded in the minutes of the meeting.

4. Statement of Reasons. In every case where the action of any board, committee, commission, or agency is subject to a right of appeal to another administrative body or to the courts of the State of Connecticut, a statement of the reasons for its action shall be included in the minutes of the meeting.

INSTRUCTIONS TO BIDDERS

The purpose of these instructions and specifications are to describe the requirements, construction, and delivery of a Fire Fighting Apparatus as outlined herein for **The Town of Southbury**, hereafter referred to as the "Purchaser".

Bids will only be considered from companies that have an established reputation in the field of fire apparatus construction and have been in business for a minimum of twenty-five (25) years.

Each bidder shall have an address with a brick and mortar location capable of doing warranty work in one of the following states of Connecticut, New York, and Massachusetts.

Each bidder shall furnish satisfactory evidence of his ability to construct the apparatus specified and shall state the location of the factory where the apparatus is to be built. The bidder shall also show that they are in a position to render prompt service and furnish replacement parts for said apparatus. Each bidder shall be capable of completing service and repairs in the field in case of an emergency.

It is the bidder's responsibility to see that their proposals arrive no later than 30 days after acceptance of specifications. Late proposals, facsimiles, telegrams, or telephone bids will not be considered.

The purchaser reserves the right to accept or reject any or all bids on such basis as the purchaser deem to be in its best interest.

All bid prices shall remain effective for 45 calendar days from the bid opening date.

The apparatus is to be of current year of manufacture and is to be new.

The bid price shall not include any local, state, or federal taxes.

DELIVERY

Each bidder shall clearly state the delivery date of the vehicle in calendar days. This shall be after receipt of the signed contract.

INTENT OF SPECIFICATIONS

It is the intent of these specifications to cover the furnishing and delivery to the purchaser a complete unit equipped as herein specified, with a view of obtaining the best results and the most acceptable apparatus for the purchaser.

These specifications cover only the general requirements as to the type of construction and test to which the apparatus 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 of all features.

All equipment and components shall comply with the National Fire Protection Association Pamphlet 1900 (2024 Edition), Standard for Automotive Fire Apparatus,

for Pumper Fire Apparatus Equipped with a Fire Pump. In addition, the apparatus shall also comply with all federal, state, ICC, and DOT regulations, standards, and laws relating to commercial vehicles as well as to the fire apparatus.

Loose equipment shall be provided only as stated in the following pages.

LIABILITY
The bidder, if his/her bid is accepted, shall defend any and all suits and assume liability for the use of any patented process, device or article forming a part of the apparatus or any appliance furnished under the contract to the extent allowable under the law.

GENERAL REQUIREMENTS
This specification package, along with any herein listed exceptions, shall be submitted as a part of the bidder's entire bid proposal. Do not detach or omit these sheets.

Proposal specifications must be on the manufacturer's own standard forms. In no case shall a bidder photocopy these specifications as his or her proposal specifications. "**NO EXCEPTIONS**"

Each bidder is required to provide in his or her bid to the purchaser a complete and accurate description of his own apparatus in the exact sequence of these specifications.

EXCEPTIONS, VARIATIONS, OR CLARIFICATIONS
These specifications are based upon performance criteria, which have been developed by the purchaser as a result of extensive research and careful analysis of the data. Subsequently, these specifications reflect the only type of fire apparatus that is acceptable at this time. Therefore, major exceptions to the specifications will not be accepted.

All bidders shall place a "Y" for yes or a "N": for no next to each and every paragraph in the column provided on the right-hand edge of the paper, indicating compliance or noncompliance with that paragraph of the specifications.

A number shall be inserted next to the paragraph, which relates to an explanation on page(s) entitled "Exceptions" that the bidder shall include with their proposal specifications.
Any exception shall be clearly defined with details as to the proposed alternative, referencing manufacturer and model where appropriate. Descriptive literature shall be provided to help evaluate the exception. A general exception cannot be taken for any paragraph. A full word for word Written Comparison shall be included within the bid for any exception listed. Each exception shall be considered by the degree of impact and total effect on the bid. Proposals taking total exception to the specifications shall not be considered by the purchaser. "**NO EXCEPTIONS**"

The purchaser shall determine which (if any) exceptions are acceptable and this determination shall be final.
The purchaser shall assume that failure to cite an exception indicates full compliance with the specifications. Should the equipment not comply with all requirements of this

document, the equipment shall be rejected at the final inspection. All equipment shall be inspected for material, workmanship, and compliance with the specifications prior to acceptance. All equipment found to be in noncompliance shall be identified and the purchaser reserves the right to accept or reject the specific items. The noncompliant rejected equipment shall be replaced or reworked to meet the requirements of this document at no additional cost to the purchaser.
The bidder shall have thirty (30) days after delivery to fulfill that part(s) of the specifications which does not comply with the original outlined specifications. Bidder shall incur all expenses of pickup and redelivery of the apparatus.

CONSTRUCTION
The materials specified are considered absolute minimum. Exceptions will not be accepted or permitted since all raw materials of the specified type are available to all manufacturers. Since all manufacturers have the ability to shear, break, and weld, as these specifications require, all basic design requirements shall be complied with.

The apparatus shall be constructed with due consideration to the nature and distribution of the load to be sustained and to the general character of service to which the apparatus is to be subjected when placed in service. All parts of the apparatus shall be of adequate strength to withstand the general service under full load. The apparatus shall be so designed that the various parts are readily accessible for lubrication, inspection, adjustment, and service.

DATA REQUIRED OF THE CONTRACTOR - NFPA 1900 - 2024 Edition

NFPA 7.21.1 Fire Apparatus Documentation. The contractor will supply, at the time of delivery, the following information:

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

(a) Owner's name and address
(b) Apparatus manufacturer, model, and serial number
(c) Chassis make, model, and serial number
(d) GAWR of front and rear axles and GVWR
(e) Front tire size and total rated capacity in pounds (kilograms)
(f) Rear tire size and total rated capacity in pounds (kilograms)
(g) Chassis weight distribution in pounds (kilograms) with water and manufacturer-mounted equipment (front and rear)
(h) For each engine, make, model, serial number, rated horsepower and related speed, and governed speed; and if so equipped, engine transmission PTO(s) make, model, and gear ratio
(i) Type of fuel and fuel tank capacity m Electrical system voltage and alternator output in amps
(j) Battery make, model, and capacity in cold cranking amps (CCA)

2. Chassis transmission make, model, and serial number; and if so equipped, chassis transmission PTO(s) make, model, and gear ratio.
   a) Ratios of all driving axles
   b) Maximum governed road speed

c) For each pump, make, model, rated capacity in gallons per minute (liters per minute where applicable), maximum discharge pressure capability rating, and serial number
d) For each pump, transmission make, model, serial number, and gear ratio
e) Auxiliary pump make, model, rated capacity in gallons per minute (liters per minute where applicable), and serial number
f) Water tank certified capacity in gallons or liters
g) Foam tank (if provided) certified capacity in gallons (liters)
h) Aerial device (if provided) type, rated vertical height in feet (meters), rated horizontal reach in feet (meters), and rated capacity in pounds (kilograms)
i) Paint manufacturer and paint number(s)
j) Company name and signature of responsible company representative
k) Weight documents from a certified scale showing actual loading on the front axle, rear axle(s), and overall fire apparatus (with the water tank full but without personnel, equipment, and hose)

3. Certification of compliance of the optical warning system *(see 10.7.17)*
4. Siren manufacturer's certification of the siren *(see 10.8.1.1)*
5. Written load analysis and results of the electrical system performance tests *(see 10.13.1 and Section 10.14)*
6. Certification of slip resistance of all stepping, standing, and walking surfaces *(see 12.6.4.5)*
7. If the apparatus has a fire pump or a wildland fire pump, the pump manufacturer's certification of suction capability *(see* 13.2.4.1 or 15.2.4.1)
8. If the apparatus is equipped with a fire pump or a wildland fire pump and special conditions are specified by the purchaser, the pump manufacturer's certification of suction capacity under the special conditions *(see* 13.2.4.2 or 15.2.4.2)
9. If the apparatus has a fire pump, or a wildland fire pump copy of the apparatus manufacturer's approval for stationary pumping applications *(see* 13.3.1 or 15.3.1)
10. If the apparatus has a fire pump, the engine manufacturer's certified brake horsepower curve for the engine furnished, showing the maximum governed speed *(see* 13.3.2.2)
11. If the apparatus has a fire pump or a wildland fire pump, the pump manufacturer's certification of the hydrostatic test *(see* 13.5.2.2 *or 15.5.2.2)*
12. If the apparatus has a fire pump with a maximum discharge pressure capability rating that exceeds the hydrostatic test pressure of 13.5.2.1, the pump manufacturer's certification of the hydrodynamic test
13. If the apparatus has a fire pump or a wildland fire pump, the certification of inspection and test for the fire pump *(see* 13.13.1.1.5 *or* 13.13.1.2.4 or 15.13.1.2.4, *as applicable)*
14. If the apparatus is equipped with an auxiliary pump, the apparatus manufacturer's certification of the hydrostatic test *(see Section* 14.13)
15. When the apparatus is equipped with a water tank, the certification of water tank capacity *(see Section* 17.6)
16. If the apparatus has an aerial device, the certification of inspection and test for the aerial device *(see Section 20.31)*
17. If the apparatus has an aerial device, all the technical information required for inspections to comply with NFPA 1910.
18. If the apparatus has a foam proportioning system, the foam proportioning system manufacturer's certification of accuracy *(see 18.10.4.2)* and the final installer's certification the foam proportioning system meets this standard *(see 18.11.2)*

19. If the system has a CAFS, the documentation of the manufacturer's pre-delivery tests *(see Section* 19.9)
20. If the apparatus has a line voltage power source, the certification of the test for the power source *(see* 21.15.7.2)
21. If the apparatus is equipped with an air system, air tank certificates *(see* 23.5.1.2), the SCBA fill station certification *(see* 23.9.6), and the results of the testing of the air system installation *(see* 23.14.5 *and 23.15.4)*
22. For wildland fire apparatus, or structural apparatus without stability control, certification of vehicle side slope stability, including the weight distribution assumed for the calculations or as loaded on the vehicle for the tilt table test *(sees 7.14.3)*
23. Any other required manufacturer test data or reports

OPERATION AND SERVICE DOCUMENTS - NFPA 1900 2024 Edition, Section 7.21.2

NFPA 1900 - 7.21.2 Operations and Service Documentation.

7.21.2.1 - The contractor shall deliver with the fire apparatus complete operation and service documentation covering the completed apparatus as delivered and accepted.

7.21.2.2 - The documentation shall address at least the inspection, service, and operations of the fire apparatus and all major components thereof.

7.21.2.3 - The contractor shall also provide the following documentation for the entire apparatus and each major operating system or major component of the apparatus:

(1) Manufacturer's name and address
(2) Country of manufacture
(3) Source for service and technical information
(4) Parts replacement information
(5) Descriptions, specifications, and ratings of the chassis, pump (if applicable), and aerial device (if applicable)
(6) Lubrication charts
(7) Operating instructions for the chassis, any major components such as a pump or aerial device, and any auxiliary systems
(8) Precautions related to multiple configurations of aerial devices, if applicable
(9) Instructions regarding the frequency and procedure for recommended maintenance
(10) Overall apparatus operating instructions
(11) Safety considerations
(12) Limitations of use
(13) Inspection procedures
(14) Recommended service procedures
(15) Troubleshooting guide
(16) Apparatus body, chassis, and other component manufacturer's warranties
(17) Special data required by this standard
(18) A safety data sheet (SDS) for any fluid that is specified for use on the apparatus
(19) For structural fire apparatus, one copy of the latest edition of FAMA's *Fire Apparatus Safety Guide*

7.21.2.4* - The contractor shall deliver with the apparatus all manufacturers' operations and service documents supplied with components and equipment that are installed or supplied by the contractor.

7.21.2.5 - Apparatus operator manuals shall be publicly accessible on the manufacturer's website.

7.21.2.6 - The apparatus shall include one or more of the following:

(1) The applicable apparatus operator manual(s) stored on the apparatus and protected in a permanent, dedicated, accessible location
(2) The applicable apparatus operator manual(s) available to be viewed on the apparatus on an accessible electronic display
(3) A means of accessing an Internet link to the applicable operator manual(s) for viewing on a computer, tablet, or smart phone

7.21.2.7 - The apparatus operator manual shall specify the quantity and type of the following fluids used in the vehicle:

(1) Engine oil
(2) Engine coolant
(3) Chassis transmission fluid
(4) Pump transmission lubrication fluid
(5) Pump priming system fluid, if applicable
(6) Drive axle(s) lubrication fluid
(7) Air conditioning refrigerant
(8) Air conditioning lubrication oil
(9) Power steering fluid
(10) Cab tilt mechanism fluid
(11) Transfer case fluid
(12) Equipment rack fluid
(13) CAFS air compressor system lubricant
(14) Generator system lubricant

7.21.2.8 - The operator manual(s) shall specify all technical information needed to perform NFPA 1910 certification testing as described in **7.21.1(16)**.

7.21.2.9* - The operator manual shall address the water fording capabilities of the vehicle.

HIGHWAY PERFORMANCE NFPA 1900, 2024 Edition, Section 7.16

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

(1) Accelerating from 0 to 35 mph (55 km/hr) within 25 seconds on a 0 percent grade
(2) * Attaining a speed of 50 mph (80 km/hr) on a 0 percent grade

(3) * Maintaining a speed of at least 20 mph (32 km/hr) on any grade up to and including 6 percent

7.16.2* - The maximum top speed of any fire apparatus with a GVWR over 33,000 lb. (15,000 kg) shall not exceed either 68 mph (109 km/hr) or the manufacturer's maximum fire service speed rating for the tires installed on the apparatus, whichever is lower.

7.16.3 - If the combined water tank and foam agent tank capacities on the fire apparatus exceed 1250 gal (4732 L), or the GVWR of the vehicle is over 50,000 lb. (22,680 kg), the maximum top speed of the apparatus shall not exceed either 60 mph (95 km/hr) or the manufacturer's maximum fire service speed rating for the tires installed on the apparatus, whichever is lower.

7.16.4* - All wildland fire apparatus shall be capable of maneuvering across a 20 percent grade and up and down a 25 percent grade.

NFPA TAG REQUIREMENTS

- A label that states the number of personnel the vehicle is designed to carry shall be located in an area visible to the driver.

- A sign that reads "**OCCUPANTS MUST BE SEATED AND BELTED WHEN APPARATUS IS IN MOTION**" shall be provided and located in the chassis cab in an area that is visible from each seating position.

- An accident prevention sign that states "**OVERALL HEIGHT OF APPARATUS ___ INCHES**"

- One "Final Stage Label" shall be attached to the driver's side doorjamb. The label shall certify that the complete vehicle conforms to the federal motor vehicle safety standards, which have been previously fully certified by the incomplete vehicle manufacture or by the intermediate vehicle manufacture and have not been affected by the final stage manufacture.

- An accident prevention sign that states "**DANGER: DO NOT RIDE ON REAR STEP WHILE VEHICLE IS IN MOTION - DEATH OR SERIOUS INJURY MAY RESULT**" shall be provided and installed at the rear of the apparatus.

- A label stating "**DO NOT WEAR HELMET WHILE SEATED**" shall be visible from each seating location.

WARRANTIES
Each bidder shall include a copy of his or her warranty with the bid proposal. The following minimum warranties shall be provided, **NO EXCEPTIONS.**

The finest materials and utmost care go into the fabrication of each new apparatus. By using normal care, without abuse, this equipment will give you lasting service.

Each new motorized Fire and Rescue Apparatus is to be free from defects in material and workmanship, under normal use and service, for a period of (2) two years. Our obligation under this warranty is limited to replacing or repairing, as the manufacturer may elect, any part or parts thereof, which, upon examination, would be determined to be defective. Such defective part or parts will be replaced, free of charge and without charge for installation, to the original purchaser.

All warranty work related to the apparatus (not including vehicle chassis) is to be performed at the manufacturer's factory or at an authorized service center.

This does not obligate the manufacturer to bear the costs of transportation charges and related expenses incurred in the replacement of parts.

BODY WARRANTY
The manufacturer shall warrant the entire stainless steel body against rust and/or full corrosion perforation and metal fatigue for a period of thirty (30) years from the date of delivery to the original purchaser, provided the apparatus is used in a normal and reasonable manner.

The term "body" shall be inclusive of the following:

- Hose bed side walls
- Compartments and compartment supports
- Compartment doors, ***except roll-up doors, when specified***
- Complete sub frame including pump house framing

WATER TANK WARRANTY
The contracted tank manufacturer shall warrant that the tank provided shall be of first-class workmanship, and that, under normal conditions, shall show no defects due to faulty design, workmanship, or material for the Lifetime of the vehicle to the original owner.

PUMP WARRANTY
The contracted pump manufacturer shall warrant that the pump provided shall be of first-class workmanship and that, under normal conditions, shall show no defects due to faulty design, workmanship, or materials for a period of five (5) years.

PUMP PLUMBING WARRANTY
The galvanized or stainless steel plumbing components as specified and ancillary brass fittings used in the construction of the water/foam plumbing system shall be warranted for a period of ten (10) years or 100,000 miles. This covers structural failures caused by defective design or workmanship, or perforation caused by corrosion, provided the apparatus is used in a normal and reasonable manner. This

warranty is extended only to the original purchaser for a period of ten years from the date of delivery.

12 VOLT ELECTRICAL WARRANTY
The 12-volt electrical system and ancillary components used in the construction of the apparatus shall be warranted for a period of five (5) years. This covers failures caused by defective design or workmanship, provided the apparatus is used in a normal and reasonable manner. This warranty is extended only to the original purchaser for a period of five (5) years from the date of delivery.

Items specifically covered are:

- Electrical harnesses and harness installation
- Switches, circuit breakers and relays
- LED Lighting: FMVSS required and warning lights
- Electrical connectors and connections against corrosion or deterioration

Items excluded as they are covered by specific warranties supplied by the manufacturer of the components:

- Chassis electrical systems and components installed by the chassis manufacturer.
- Batteries, battery chargers, two-way radio equipment, and similar equipment.
- Periodic cleaning and tightening of battery terminal connections.
- Accident, negligence, or unauthorized alteration of original equipment.

PAINT WARRANTY
The paint on the unit will be provided with a seven (7) year non-pro-rated paint finish guarantee, which will cover the finish for the following items:

- Peeling or delamination of the top coat and/or other layers of paint.
- Cracking or checking.
- Loss of gloss caused by defective finishes which are covered by this guarantee.

CHASSIS WARRANTY
Chassis shall be warranted by the chassis manufacturer, as per the chassis manufacturer's issued warranty.

100% WARRANTY ON ALL OTHER ITEMS FOR (2) TWO YEARS.

THIS WILL NOT APPLY
1. To normal maintenance services or adjustments.
2. To damage caused by negligence of normal maintenance.
3. To any vehicle which shall have been repaired or altered outside our factory in any way, so as, in our judgement, to affect its stability, nor which has been subjected to negligence, or accident, nor to any vehicle made by us which shall have been operated at a speed exceeding the factory-rated speed, or loaded beyond the factory-rated load capacity.
4. To major components such as purchased chassis and associated equipment furnished with chassis, signaling devices, generators, batteries, or other trade

accessories, inasmuch as they are usually warranted separately by their respective manufacturers or to ancillary equipment used in rescue or firefighting.

5. To loss of time or use of vehicle, inconvenience or other incidental expenses.

THIS WARRANTY IS MADE EXPRESSLY IN LIEU OF ALL OTHER WARRANTIES, EXPRESSED OR IMPLIED, WITH RESPECT TO QUALITY, MERCHANTABLILITY, OR FITNESS FOR A PARTICULAR APPLICATION.

SINGLE SOURCE WARRANTY COORDINATION

To protect the purchaser from divided warranty responsibility between chassis and body manufacturers, the manufacturer, and local dealer shall coordinate the apparatus warranty for the specified vehicle from bumper to bumper. Inclusive of individual component warranties, the winning bidder shall function as the sole source warranty coordinator on the entire vehicle. This shall include the cab shell, chassis assembly, and complete body structure.

DELIVERY & DEMONSTRATION

Apparatus will be delivered under its own power to insure proper break in of all components while still under warranty.

A qualified delivery engineer representing the manufacturer., will deliver the apparatus and remain with the fire department for one day to demonstrate the apparatus and provide initial instruction to representatives of the fire department regarding the operation, care, and maintenance of the apparatus and equipment supplied.

PRE-CONSTRUCTION CONFERENCES AND INSPECTION TRIPS

Pre-Construction Conferences and Inspection trips shall be provided as follows:

There shall be at least to (2) Pre-Construction Conferences, to be held at a mutually agreeable place:

- One (1) before the chassis is ordered
- One (1) before manufacturing begins on the body

Two (2) trips shall be provided. Each trip will cover cost for transportation, meals, and lodging for three (3) people each trip. The trips will take place at the following times:

- Pre-Construction Conference at the bidder's factory.

- Final inspection upon completion of apparatus at the bidder's factory

OVERALL APPARATUS DIMENSIONS AND REQUIREMENTS

The fallowing dimensions shall be provided below and in a drawing.

1. Wheelbase of chassis:

2. Cab-to-axle dimension of chassis:

3. Overall length of apparatus:

4. Overall width of apparatus body:

5. Overall height of apparatus:

6. Overall length of body including rear step:

7. Front overhang from center of front axle:

8. Rear overhang from center of rear axle:

9. Pump panel width:

CHASSIS SPECIFICATION

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. All Crew compartment structures are preferred to be fabricated with stainless steel. The use of alternative metals is permissible provided equivalent safety strength, and anti-corrosion methods are provided. The use of galvanneal steel for any components is not allowed in any area of the truck.

MODEL YEAR

The chassis shall have a vehicle identification number that reflects a 2026 or later 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.

APPARATUS TYPE

The apparatus shall be a pumper vehicle designed for emergency service use, which shall be equipped with a permanently mounted fire pump, which has a minimum rated capacity of 1750 gallons per minute or preferred 2000 gallons per minute (7570 L/min).

The apparatus shall include a water tank and hose body whose primary purpose is to combat structural and associated fires.

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.

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: since the tangent 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 4 x 2-axle configuration consisting of a single rear drive axle with a single front steer axle.

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

PUMP PROVISION
The chassis shall include provisions to mount a driveline pump in the middle of the chassis, behind the cab, more commonly known as the midship location. Chassis driveline pump provisions shall include an interlock feature for automatic setting of the park brake when the vehicle is shifted into pump mode while the transmission is in neutral and the transmission output speed translates to less than 1 mph. When the conditions are met, the driver side parking brake valve shall activate. Once shifted to road mode the condition for electric automatic brake engagement is no longer present and the driver's parking brake control valve shall function normally.

WATER & FOAM TANK CAPACITY
The chassis shall include a carrying capacity of 1,000 gallons (2839 liters). The water and/or foam tank(s) shall be supplied and installed by the apparatus manufacturer.

CAB STYLE
The cab shall be a custom, fully enclosed, EMFD model with a 10.00 inch raised 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 six (6) seating positions.

The cab shall incorporate a fully enclosed design with sidewall 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 sidewall 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 rollover protection. The cab sidewalls and lower roof skin shall be 0.13 inch thick; the rear wall and raised roof skins shall be 0.09 inch thick; the front cab structure shall be 0.19 inch thick.

The exterior width of the cab shall be 94.00 inches wide with a minimum interior width of 88.00 inches. The overall cab length shall be 137.10 inches with 60.00 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 65.00 inches in the raised roof area, 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 57.88 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 approximately 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 approximately of 32.25 inches wide X 61.00 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, and 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 pre-tensioners if it detects a frontal crash.

A RollTek™ 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 pre-tensioners, 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 fascia shall include a box style, 304 stainless steel front grille approximately 44.45 inches wide X 33.50 inches high X 1.50 inches deep. The grille shall include a minimum free air intake of 732.00 square inches. The upper portion of the grille shall be hinged to provide service access behind the grille.

CAB UNDERCOAT
There shall be undercoating applied to the underside of the cab which provides an abrasion resistant coating for protection against corrosion caused by moisture, salt, alkalis and galvanic reaction.

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 following the RFG-SR-001 paint standards.

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 primary/lower paint color shall be PPG 71663 Red

CAB PAINT SECONDARY/UPPER COLOR
The secondary/upper paint color shall be PPG 3359 Gray Metallic

CAB PAINT EXTERIOR BREAKLINE
The upper and lower paint shall meet at a break line on the cab, which shall be located approximately 1.00 inch below the door windows on each side of the cab. The break line 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
The paint break between the two colors around the cab shall be wet sanded smooth for application of Twenty-Three and one half Karat (23.5KT) gold leaf adhesive backed striping, outlined in black, shall be installed on the cab. Striping shall be 1/2-inch in dimension. The paint break shall be horizontal across the front of the cab above the wipers and taper down with a radius even with the outside corners of the grille.

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 doorframe 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 full length in design to fully enclose the lower cab steps. Entry doors shall include Pollak mechanical plunger style switches for electrical component activation.

CAB INSULATION
The cab ceiling and walls shall include a 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.

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 COE Frontal Strength Evaluation Dynamic Loading Heavy Trucks, Section 5 of SAE J2422 Cab Roof Strength Evaluation Quasi –Static Loading Heavy Trucks and ECE R29 Uniform Provisions Concerning the Approval of Vehicles with regard to the Protection of the Occupants of the Cab of a Commercial Vehicles 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.

VEHICLE DISPLAY
The multiplex electrical system shall include a Weldon Vista IV display, which shall be located on the left side of the dash in the switch panel. The Vista IV shall feature a full color LCD display screen that includes 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 screen shall be video ready for back-up cameras, thermal cameras, and DVD.

The Vista IV display shall offer varying fonts and background colors. The display 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, 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 shall be provided and installed behind the electrical center cover with a 40-amp breaker. The studs shall be 0.38-inch diameter and capable of carrying up to a 40-amp load switched with the master power switch.

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 medium heavy duty (MHD) certified X10 engine or larger. The X10 engine shall be an in-line six (6) cylinder, four-cycle diesel-powered engine. The engine shall offer a rating of 450 horsepower at 2100 RPM and shall be governed at 2200 RPM. The torque rating shall feature 1250-foot pounds of torque at 1200 RPM.

The engine shall feature a VGT™ Turbocharger, a high-pressure common rail fuel system, fully integrated electronic controls with an electronic governor, and shall be EPA certified to meet the 2027 emissions standards.

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.

Until the 2027 EPA engine integration is finalized, option availability and body design relative to engine and after treatment are subject to change. Additional costs associated with the 2027 EPA engine will be passed on to the end user. No exceptions.

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. The tunnel shall be a maximum of 41.50 inches wide X 25.50 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.

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 an automatic high-idle speed control, which shall be pre-set to operate the engine at a specified RPM to increase alternator output if the system voltage drops to 12.5 volts. This device shall automatically operate only when the engine is running, the transmission is in neutral, and with the parking brake set. The automatic high idle will stay engaged for a minimum of ten (10) minutes and until the system, voltage has reached 13.0 volts. Application of the service brake will override the automatic high idle and reset timer. The vehicle shall be equipped with a high-idle speed virtual button on the vehicle display and control screen to activate/deactivate manual control only. It shall be pre-set so when activated, it will operate the engine at the specified RPM to increase alternator output. This device shall operate only when the engine is running; the transmission is in neutral, and with the parking brake set. When automatically engaged the high idle 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 pedal is released, or when the transmission is placed in neutral. Virtual control screen shall not override automatic high idle between voltage parameters during timed cycle. Display shall indicate when high idle is disabled, enabled, or active.

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 gearshift.

The compression brake shall be controlled through an on/off switch and a low/medium/high selector switch.

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.

REMOTE THROTTLE CONTROL
A Fire Research In Control 400 pressure sensor governor shall be provided for the electronic engine. It shall include a remote mountable control head.

The In Control shall regulate the pump pressure and monitor all essential engine parameters.

LED readouts shall display RPM, PSI, pump discharge and intake pressure, engine oil pressure, engine temperature, transmission temperature and battery voltage. An audible alarm output shall also be part of the system.

The rpm increase and decrease will be controlled by control knob on the face of the In Control 400.

REMOTE THROTTLE HARNESS
An apparatus interface wiring harness for the engine shall be supplied with the chassis. The harness shall include a connector for connection to the chassis harness, which shall terminate in the left frame rail behind the cab for reconnection by the apparatus builder. The harness shall contain connectors for a Fire Research In Control 300/400 pressure governor and a multiplexed gauge. Separate circuits shall be included for pump controls, “Pump Engaged” and “OK to Pump” indicator lights, open compartment ground, start signal, park brake ground, ignition signal, master power, customer ignition, air horn solenoid switch, high idle switch and high idle indication light. The harness shall contain interlocks that will prevent shifting to road or pump mode unless the transmission output speed translates to less than 1 mph and the transmission is in neutral. The shift to pump mode shall also require the park brake be set. The harness shall be designed for a side mount pump panel.

An apparatus interface wiring harness shall also be included which shall be wired to the cab harness interface connectors and shall incorporate circuits with relays to control pump functions. This harness shall control the inputs for the transmission lock up circuits, governor/hand throttle controls and dash display which shall incorporate “Pump Engaged” and “OK to Pump” indicator lights. The harness shall contain circuits for the apparatus builder to wire in a pump switch.

ENGINE PROGRAMMING REMOTE THROTTLE
The engine ECM (Electronic Control Module) discreet wire remote throttle circuit 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 clutch fan shall override the thermostatic variable speed and function as full on automatically in pump mode.

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 complete 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.

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, 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 dual module after treatment device, and downpipe from the charge air-cooled turbo. The dual module shall include a diesel particulate filter (DPF), urea-dosing module (UL2), and a selective catalytic reduction (SCR) catalyst to meet current EPA standards.

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 DPF, the decomposition tube, and the SCR canister 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 five (5) usable gallons and shall be mounted on the left hand side of the chassis 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 splashguard accessible in the top rear step.

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 ten (10) years, or 280,000 miles, or 14,000 engine hours limited warranty for medium heavy-duty engines in accordance with, and subject to, warranty certificate RFW0143. The warranty

certificate is incorporated by reference into this proposal and included with this proposal or available upon request.

REGULATED EMISSIONS WARRANTY TIRES
Purchaser shall receive a regulated emissions tires two (2) years or 24,000 miles limited warranty in accordance with, and subject to, warranty certificate RFW0145. The warranty certificate is incorporated by reference into this proposal and included with this proposal or available upon request.

REGULATED EMISSIONS WARRANTY AIR CONDITIONING
Purchaser shall receive a regulated emissions air conditioning five (5) years or 100,000 miles limited warranty in accordance with, and subject to, warranty certificate RFW0146. 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. 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™ 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 3.49:1
2nd 1.86:1
3rd 1.41:1
4th 1.00:1
5th 0.75:1
6th 0.65:1 (if applicable)
Rev 5.03:1

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 198 vocational package in consideration of the duty of this apparatus as a pumper. 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.

This package shall be coupled with the use of a split shaft PTO and incorporate pumping circuits. These circuits shall be used allowing the vehicle to operate in the fourth range lockup while operating the pump mode due to the 1 to 1 ratio through the transmission, therefore the output speed of the engine is the input speed to the pump. The pump

output can be easily calculated by using this input speed and the drive ratio of the pump itself to rate the gallons of water the pump can provide.

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	Description	Wire assignment
Inputs		
C	PTO Request	142
J	Fire Truck Pump Mode (4th Lockup)	122 / 123
Outputs		
C	Range Indicator	145 (4th)
G	PTO Enable Output	130
	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.

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.

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 4:00 o'clock position.

DRIVELINE
All drivelines shall be heavy-duty metal tube and equipped with MSI 1710 series universal joints. 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. The drivelines shall include Meritor brand u-joints with thrust washers.

MIDSHIP PUMP / GEARBOX
A temporary jackshaft driveline shall be installed by the chassis manufacturer to accommodate the mid-ship split shaft pump as specified by the apparatus manufacturer.

MIDSHIP PUMP / GEARBOX MODEL
The midship pump/gearbox provisions shall be for a Waterous.

MIDSHIP PUMP GEARBOX DROP
The pump gearbox shall have an "L" (long) drop length if needed.

MIDSHIP PUMP RATIO
The ratio for the midship pump shall be 2.28:1 (23).

MIDSHIP PUMP LOCATION C/L SUCTION TO C/L REAR AXLE
The midship pump shall be located so the dimension from the centerline of the suction to the centerline of the rear axle is 80.00 inches.

PUMP SHIFT CONTROLS
One (1) pump shift control panel shall be located on the left hand side of the engine tunnel, integrated with the shifter pod. The following shall be provided on the panel: a three (3) position locking toggle switch; an engraved PUMP ENGAGED identification light, and an engraved OK TO PUMP identification light. The pump shift control panel shall be black with a yellow border outline. One (1) label indicating pump instructions and the transmission shift selector position used for pumping shall be provided and located so it can be read from the driver's position per NFPA **16.10.1.3**. The road mode shall be selected when the switch is in the up (forward) position and pump mode shall be selected when the switch is in the down (aft) position.

The center switch position shall exhaust air from both pump and road sides of the pump gearbox shift cylinder.

PUMP SHIFT CONTROL PLUMBING
Air connections shall be provided from the air supply tank to the pump shift control valve and from the pump shift control valve to the frame mounted bracket. The frame-mounted bracket shall include labeling identifying the pump and road connection points with threaded 0.25-inch NPT fittings on the solenoid for attaching the customer installed pump. The air supply shall be pressure protected from service brake system.

FUEL FILTER/WATER SEPARATOR
The fuel system shall have a Fleetguard FS20121 fuel filter/water separator as a primary filter. The fuel filter shall have a drain valve.

A water in fuel sensor shall be provided and wired to an instrument panel lamp and audible alarm to indicate when water is present in the fuel/water separator.

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

FUEL LINES
The fuel system supply and return lines installed from the fuel tank to the engine shall be reinforced nylon tubing rated for diesel fuel. The fuel lines shall be brown in color and connected with brass 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 TANK
The fuel tank shall have a capacity approximately of fifty (50) gallons and shall measure approximately 35.00 inches in width X 15.00 inches in height X 24.00 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 straphanger 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, aluminized steel. The exterior of the tank shall be powder coated black and then shall feature a spray on bed liner coating.

All powder coatings, primers, and paint shall be compatible with all metals, pretreatments, and primers used. The crosshatch 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 ASTM A-36 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 offset with the left fill port located in the rearward position and the right fill port located in the middle position on the fuel tank.

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 Meritor Easy Steer Non drive front axle, model number MFS-20. The axle shall include a 3.74-inch drop and a 71.00-inch king pin intersection (KPI). The axle shall include a conventional style hub with a standard knuckle.

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
Two (2) Bilstein inert, nitrogen gas filled shock absorbers shall be provided and installed as part of the front suspension system. The shocks shall be a monotubular design, fabricated using a special extrusion method, utilizing a single blank of steel without a welded seam, achieving an extremely tight peak-to-valley tolerance, and maintains consistent wall thickness. The monotubular design shall provide superior strength while maximizing heat dissipation and shock life.

The ride afforded through the use of a gas shock is more consistent and shall not deteriorate with heat, the same way a conventional oil filled hydraulic shock would.

The Bilstein front shocks shall include a digressive working piston assembly allowing independent tuning of the compression and rebound damping forces to provide optimum ride and comfort without compromise. The working piston design shall feature fewer parts than most conventional twin tube and “road sensing” shock designs and shall contribute to the durability and long life of the Bilstein shock absorbers.

Proposals offering the use of conventional twin tube or “road sensing” designed shocks shall not be considered.

FRONT SUSPENSION
The front suspension shall include a ten (10) leaf spring pack in which the longest leaf measures 54.00 inch long and 4.00 inches wide and shall include a military double

wrapped front eye. Both spring eyes shall have a case hardened threaded bushing installed with lubrication counter bore and lubrication land off cross bore with grease fitting.

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 48-degrees to the left and 44-degrees to the right.

POWER STEERING GEAR
The power steering gear shall be a TRW model TAS 65 with an assist cylinder.

CHASSIS ALIGNMENT
The chassis frame rails shall be measured to insure the length is correct and crosschecked 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 RS-25-160 single drive axle. The axle shall include precision forged, single reduction differential gearing and shall be rated for the fire service.

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 0.63 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. Industry-standard 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 WHEEL BEARING LUBRICATION
The rear axle wheel bearings shall be lubricated with oil.

REAR AXLE DIFFERENTIAL CONTROL
A driver controlled differential lock shall be installed on the rear axle. 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 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 differential control.

VEHICLE TOP SPEED
The top speed of the vehicle shall be approximately 65 MPH +/-2 MPH at governed engine RPM.

REAR SUSPENSION
The single rear axle shall feature a Reyco 79KB vari-rate, self-leveling captive slipper type conventional multi-leaf spring suspension, with 57.50 inch X 3.00 inch springs. One (1) adjustable and one (1) fixed torque rod shall be provided.

The rear suspension capacity shall be rated from 21,000 to 31,500 pounds.

SNOW CHAINS - ONSPOT
One set of Onspot six (6) strand snow chains shall be provided and installed on the rear axle of the chassis to provide instant traction while traveling on ice and snow at speeds below 30 MPH. Control switch shall be located in the cab. The tire chain system shall be activated by a locking switch on the dash to deter accidental activation. The light on the switch shall illuminate when the tire chains are engaged. The tire chains shall be interlocked with the transmission and shall engage only if the vehicle is traveling 30 MPH or less. After traveling over 30 MPH, the vehicle must be reduced to a speed below 5 MPH for the tire chains to be engaged or re-engaged.

TIRE CHAIN ADJUSTMENT AND TESTING
The automatic tire chains furnished with the custom chassis shall be adjusted and road tested to assure proper operation. Tires, wheels, and body will be checked to ensure that standard chains will have sufficient clearance.

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 315/80R-22.5 20PR "L" tubeless radial XZUS 2 regional tread.

The front tire stamped load capacity shall be 20,000 pounds per axle with a nominal speed rating of 65 miles per hour when properly inflated to 130 pounds per square inch.

The Michelin Intermittent Service Rating maximum load capacity shall be 21,400 pounds per axle with a maximum speed of 65 miles per hour when properly inflated to 130 pounds per square inch.

The Michelin Intermittent Service Rating maximum speed capacity shall be 20,000 pounds per axle with a speed rating of 75 miles per hour when properly inflated to 130 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 5.13:1.

TIRE PRESSURE INDICATOR
There shall be electronic chrome LED valve caps shipped loose for installation by the OEM, which shall illuminate with a red LED when tire pressure drops 8psi provided. The valve caps are self-calibrating and set to the pressure of the tire upon installation.

FRONT WHEEL

The front wheels shall be Alcoa hub piloted, 22.50 inch X 9.00 inch aluminum wheels. The outer face of the wheels shall feature Alcoa's Dura-Bright® finish as an integral part of the wheel surface. Alcoa Dura-Bright® 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 outer 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. 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 lug nut covers and 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 rear wheels shall include stainless steel lug nut covers and band mounted spring clip stainless steel high hats shipped loose with the chassis for installation by the apparatus builder.

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

BRAKE SYSTEM
A rapid build-up air brake system shall be provided. The air brakes shall include, at a minimum, a two (2) air tank, three (3) reservoir system with a total of 4152 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 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 four (4) sensor, four (4) modulator Anti-lock Braking System (ABS) shall be installed on the front and 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 single rear axle. The ATC system shall apply the ABS when the drive wheels lose traction. The system shall scale the electronic engine throttle back to prevent wheel spin while accelerating on ice or wet surfaces.

A virtual button on the vehicle display and control screen 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 disc brakes with vented rotors.

REAR BRAKES
The rear brakes shall be Meritor disc brakes.

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.

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.

REAR BRAKE SLACK ADJUSTERS
The rear brakes shall include Meritor automatic slack adjusters installed on the axle, which features a simple, durable design offering reduced weight. The automatic slack

adjusters shall feature a manual adjusting nut which cannot inadvertently be backed off and threaded grease fittings for easy serviceability.

AIR DRYER
The brake system shall include a Wabco System Saver 1200 air dryer with an integral 100-watt 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 located on the right hand frame rail forward of the front wheel behind the right hand cab step.

FRONT BRAKE CHAMBERS
The front brakes shall be provided with MGM type 24 long stroke brake chambers.

REAR BRAKE CHAMBERS
The rear axle shall include TSE 30/36 brake chambers, which 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 Type 36 brake chamber has a 36.00 square inch effective area.

AIR COMPRESSOR

The air compressor provided for the engine shall be a Wabco® 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.

MOISTURE EJECTORS
Manual pet-cock type drain valves shall be installed on all reservoirs of the air supply system.

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.

Push to connect type fittings shall be used on the nylon tubing. All drop hoses shall include fiber reinforced neoprene covered hoses.

REAR AIR TANK MOUNTING

If a combination of wheelbase, air tank quantity, or other requirements necessitate the location of one or more air tanks to be mounted rear of the fuel tank, these tank(s) will be mounted perpendicular to frame.

WHEELBASE
The chassis wheelbase shall be 190.00 inches.

REAR OVERHANG
The chassis rear overhang shall be 47.00 inches.

FRAME
The frame shall consist of double rails running parallel to each other with cross members forming a ladder style frame. The frame 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 upper and lower flanges X 0.38 inches thick with an inner channel of 9.44 inches high X 3.13 inches deep and 0.38 inches thick. Each rail shall be constructed of 110,000-psi minimum yield high strength low alloy steel. Each double rail section shall be rated by a Resistance Bending Moment (RBM) minimum of 3,213,100 inch pounds and have a minimum section modulus of 29.21 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 PAINT
The frame shall be hot dip galvanized prior to assembly and attachment of any components. The components that shall be galvanized shall include:

- Main frame “C” channel or channels
- Front splayed rails and fish plates
- Cross members (excluding suspension cross members)
- Cross member gussets
- Fuel tank mounting brackets

- Fuel tank straps (unless material/finish is specified in 3130 subcat)
- Air tank mounting brackets (unless material/finish is specified in 3205, 3305, or 2232 subcat)
- Exhaust mounting brackets
- Air dryer bracket
- Air cleaner skid plate (if applicable)
- Radiator skid plate (if applicable)
- Battery supports
- Battery trays (unless material/finish is specified in 5106 subcat)
- Battery covers (unless material/finish is specified in 5107 subcat)

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

- Bumper extensions
- Steering gear bracket
- Air tanks (unless color coded tanks are specified in 3205 subcat)

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 crosshatch 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.

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 (Zinc Plate) Twenty (20) Years or 132,000 Miles limited warranty in accordance with, and subject to, warranty

certificate RFW0314. The warranty certificate is incorporated by reference into this proposal, and included with this proposal or available upon request.

FRONT BUMPER
A heavy-duty 1/4-inch-thick painted steel bumper shall be mounted to the front of the chassis. Bumper shall be channel shaped with 2-1/4-inch flanges. The extension of the bumper shall be minimized to allow mounting of the Q2B siren, air horns, and not interfere with cab tilt operations. It shall be painted to match the lower cab color. The front bumper trim shall feature a black spray on bed liner coating. The bumper shall be designed and constructed so that the apparatus can be lifted and towed by the extension.

FRONT BUMPER EXTENSION LENGTH
The front bumper shall be extended approximately 21.00 inches ahead of the cab.

FRONT BUMPER SUCTION PROVISION
The bumper apron shall include a 5.00-inch stainless steel pipe intended for use as a suction intake for the pump. The suction pipe shall be routed from the right hand front bumper area to the area rear of the front axle near the back of the cab.

The front of the suction pipe shall be designed to extend horizontally 2.00 inches past the front surface of the bumper in the right hand outboard position.

The forward end of the suction pipe shall be finished with a 5.00 inch National Pipe Thread (NPT). The rear of the suction shall include a Victaulic groove for connecting to the pump plumbing. The suction pipe shall also include a 0.50-inch NPT port intended as a primer assist connection.

The apparatus manufacturer shall plumb the suction pipe to the pump and shall provide all valves as required.

FRONT BUMPER APRON
The 21.00 inch extended front bumper shall include an apron constructed of 0.19-inch thick embossed aluminum tread plate.

The apron shall be installed between the bumper and the front face of the cab affixed using stainless steel bolts attaching the apron to the top bumper flange.

FRONT BUMPER DISCHARGE
The chassis shall include frame mounted 2.50-inch diameter plumbed pipe intended for use as a discharge trash line. The discharge pipe shall be routed from the left hand front splay rail area behind the bumper to the area rear of the front axle, ahead of the battery box.

The discharge shall pipe shall be a, 2.50 inch stainless steel schedule 10 tube. The discharge shall include a Victaulic groove for connecting to the pump and discharge hose plumbing on each end of the tube.

The apparatus manufacturer shall plumb the discharge pipe to the pump and shall provide all valves as required.

FRONT BUMPER COMPARTMENT LEFT
The front bumper shall include a compartment in the bumper apron located on the left of the frame rails, which may be used as a hose well. The compartment shall be constructed of 0.13 inch 5052-H32 grade aluminum and shall include drain holes in the bottom corners to allow excess moisture to escape. This compartment shall be capable of storing 150' of 1.75 double-jacketed attack hose.

FRONT BUMPER COMPARTMENT CENTER
The front bumper shall include a compartment in the bumper apron located in the center between the frame rails, which may be used as a hose well. The compartment shall be constructed of 0.13 inch 5052-H32 grade aluminum and shall include drain holes in the bottom corners to allow excess moisture to escape. This compartment shall be capable of storing 20' of 5" soft suction and 50' of 1.75 double-jacketed attack hose with a divider in between the hoses.

MECHANICAL SIREN
The front bumper shall include an electro mechanical Federal Q2B™ siren, which shall be streamlined, chrome-plated and shall produce 123 decibels of sound at 10.00 feet. The Q2B™ 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 on the left side of the front fascia of the bumper approximately in the center of the flat surface between the bumper radius and the frame rail.

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 fascia between the frame rails in the right and left outboard positions. Centered vertically in the front bumper flat surface.

AIR HORN RESERVOIR
One (1) air reservoir, with a 1200 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 in the center position between the frame rails.

FRONT BUMPER TOW HOOKS
Two (2) heavy-duty tow hooks, painted to match the frame components, shall be installed below the front bumper in the forward position, bolted directly to the underside of each chassis frame rail with grade 8 bolts.

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 AUXILIARY PUMP
A manual cab tilt pump module shall be attached to the cab tilt pump housing/power distribution box.

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 final adjustment of the switch shall be performed by the

apparatus manufacturer to prevent damage to the cab or any bumper-mounted option mounted in the cab tilt arc.

CAB TILT ALARM
A Preco Matic model 1059 audible alarm shall be installed and shall automatically activate the pulsed warble sounding alarm when the cab tilt is actuated acting as a notification and warning.

CAB TILT CONTROL RECEPTACLE
A 25.00-foot cab tilt control harness shall be provided on the right side of frame just behind the cab. This harness shall consist of an 8.00-foot harness connected to the tilt pump and a 17.00-foot extension harness with a six (6) pin Deutsch connector with cap for mounting in a compartment in the body.

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 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 with the parking brake released.

CAB WINDSHIELD
The cab windshield shall be a 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 bonded to the cab using a high strength commercial grade automotive adhesive.

GLASS FRONT DOOR
The front cab doors shall include windows that 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 gray automotive tint, which shall allow seventy-five percent (75%) light transmittance.

GLASS REAR DOOR RH
The rear right hand side door shall include a window that will have the capability to roll down completely into the door housing. This shall be accomplished using electric actuation. The window 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.

GLASS TINT REAR DOOR RIGHT HAND
The window located in the right hand side rear door shall include a standard gray automotive tint, which shall allow seventy-five percent (75%) light transmittance.

GLASS REAR DOOR LH
The rear left hand side door shall include a window that will have the capability to roll down completely into the door housing. This shall be accomplished using electric actuation. The window 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.

GLASS TINT REAR DOOR LEFT HAND
The window located in the left hand side rear door shall include a standard gray automotive tint, which shall allow seventy-five percent (75%) light transmittance.

CABIN AIR FILTRATION SYSTEM
An Active Air Purification system will be installed in the cab. The system utilizes RGF's Photohydroionization® Cell (PHI-Cell®) technology, which produces hydro-peroxides and hydroxide ions, reducing airborne mold, bacteria, viruses, and odors up to 99%.

The system shall include a stainless-steel housing approximately 7.50 inches high X 16.13 inches wide X 6.6 inches deep in a trapezoid shape and shall be located at the upper portion of the rear wall mounted in a horizontal orientation. The system shall be 12V DC and shall be active either when the ignition power is on, or when the shoreline is connected.

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.

Six (6) adjustable louvers shall provide comfort for the front seat occupants and ten (10) adjustable louvers shall provide comfort for the rear crew occupants. The plenum shall be shortened to terminate in the mid crew area on cabs with 10.00 inch raised roofs and greater. This shortened plenum shall allow the customer to utilize the upper rear center wall for compartmentation, equipment, or apparatus operations.

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 in the center dash center switch panel, in a position, which is easily accessible to the driver. The climate control shall be activated by a rotary switch.

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

A/C CONDENSER LOCATION

A roof mounted A/C condenser shall be installed centered on the cab forward of the raised roof against the slope rise.

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.

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 a cast aluminum trim piece at each cab door opening. 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 breakaway 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 two (2) Blue Sea dual universal serial bus (USB) charging receptacles in the cab dash switch panel to provide a power source for USB chargeable electrical equipment. The USB ports shall be capable of a 5 Volt-4.8 amp total output. The receptacles shall be wired battery direct.

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 splashguard to reduce water and debris from splashing in to the step. The splashguard 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.

UNDER CAB ACCESS DOOR
The cab shall include an aluminum access door in the left crew step riser painted to match the cab interior paint 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 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, city, township, or county.

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 manufactures logo. The chevron tape shall measure 6.00 inches in height.

INTERIOR GRAB HANDLES "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 windowsill. The handle shall assist personnel in exiting and entering the cab.

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 five (5) switches. There shall be three (3) across the top of the panel with two (2) 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 switches 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 six (6) rocker switch positions in a three (3) over three (3) switch configuration.

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.

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 vehicle 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, wear resistant fabric made of durable low seam Durawear Plus™ ballistic polyester. A PVC coating shall be bonded to the backside of the material to help protect the seats from UV rays and from being saturated or contaminated by fluids. Durawear Plus™ meets or exceeds specification of the common trade name Imperial 1800. The material meets FMVSS 302 flammability requirements.
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 backside 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 manufactures 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 three-point 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™ 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 headrest.

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™ Systems, which shall secure belted occupants and increase the survivable space within the cab. The 4Front and RollTek™ 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.

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 and located as far back as possible.

The seat shall feature an all belts to seat (ABTS) style of safety restraint. The ABTS feature shall include a three-point 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™ 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.

SEAT MOUNTING- OFFICER

The officer's seat shall be installed as far back as possible in an ergonomic position in relation to the cab dash.

OCCUPANT PROTECTION-OFFICER
The officer's position shall be equipped with the IMMI 4Front and RollTek™ Systems, which shall secure belted occupants and increase the survivable space within the cab. The 4Front and RollTek™ 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.

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- REAR FACING OUTER LOCATION
The crew area shall include two (2) rear facing crew seats, which include one (1) located directly behind the left side front seat and one (1) located directly behind the right side front seat.

The primary position designation per NFPA 1900 2024 edition, shall only declare the positioning in the cab offers a minimum width of 27.60 inches of shoulder clearance without overlap of any other primary seating position and a minimum of 10.80 inches each side of seat centerline. Clear width may be offset from center of seat cushion by up to 3.00 inches. It shall also offer a minimum of 22.00 inches of shoulder width clearance without any overlap of any position.

SEAT CREW-REAR FACING OUTER
The crew area shall include a seat in the rear facing outboard 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 shall feature an all belts to seat (ABTS) style of safety restraint. The ABTS feature shall include a three-point 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™ 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- REAR 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.

SEAT MOUNTING- REAR FACING OUTER
The rear facing outer seats shall offer special mounting positions, which shall be 2.00 inches towards the rear wall offering additional space between the front seats and the outer rear facing seats.

OCCUPANT PROTECTION RFO
The rear facing outer seat position(s) shall be equipped with the RollTek™ System, which shall secure belted occupants and increase the survivable space within the cab. The RollTek™ System shall deploy integrated systems to protect against injuries in rollover events.

The rear 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.

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 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 three-point 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™ 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.

OCCUPANT PROTECTION FFC
The forward facing center seat positions shall be equipped with the RollTek™ 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:

1. 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.

SEAT FRAME- FORWARD FACING
The forward facing center seating positions shall include an enclosed seat frame located and installed on the rear wall. The seat frame shall measure 42.38 inches wide X 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
There shall be two (2) access points to the seat frame storage area, one (1) on each side of the seat frame. Each access point shall be covered by a hinged door, which measures 15.00 inches in width X 10.63 inches in height with an opening that measures 13.75 inches wide X 10.00 inches high.

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 under seat 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.

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.

GRAB HANDLES
The cab shall include one (1) 18.00-inch three-piece knurled aluminum, anti-slip exterior assist handle, installed behind each cab door. The assist handle shall be made of extruded aluminum with a knurled finish to enable non-slip assistance with a gloved hand.

LIGHTED GRAB HANDLES
The grab rails shall include a 12-volt, 17.00-inch long blue LED light to provide an increased margin of safety for nighttime cab entry and egress.

REARVIEW MIRRORS
Retrac Aerodynamic West Coast style dual vision mirror heads model 613305 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 integral convex mirrors installed in the mirror head below the flat glass to provide a wider field of vision. The flat and convex mirrors shall be motorized with remote horizontal and vertical adjustment. The control switches shall be mounted within easy reach of the driver. The flat and convex mirrors shall be heated for defrosting in severe cold weather conditions.

The mirrors shall be constructed of a vacuum formed chrome plated ABS plastic housing that is corrosion resistant and shall include 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 vehicle display and control screen.

CAB FENDER
Full width wheel well liners shall be installed on the extruded cab to limit road splash and enable easier cleaning. Fender shall consist of an inner liner 16.00 inches wide made of ABS composite and an outer fenderette 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.

CAB EXTERIOR FRONT & SIDE EMBLEMS
The cab shall include three (3) manufacturer emblems. There shall be one (1) installed on the front air intake grille and one (1) emblem on each of the cab sides.

CAB EXTERIOR MODEL NAMEPLATE
The cab shall include manufactures nameplates on the front driver and officer side doors.

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 five (5) Harris BCI 31 925 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) 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 airflow and help prevent moisture build up.

BATTERY BOX COVER
Each battery box shall include a cover, which protects the top of the batteries.

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.

ALTERNATOR
The charging system shall include a 320-amp Leece-Neville 12 volt alternator. The alternator shall include a self-exciting integral regulator.

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

BATTERY CONDITIONER
A Kussmaul Auto Charge Chief 4012 battery conditioner shall be supplied. The battery conditioner shall provide a circuit protected 40-amp output for the chassis batteries and a 20-amp output circuit for accessory loads. The conditioner shall also include a battery temperature sensor.

BATTERY CONDITIONER LOCATION
The battery conditioner shall be mounted in the cab in the left-hand rear facing outer seating position.

BATTERY CONDITIONER DISPLAY
A Kussmaul battery conditioner display with a Digital Status Center shall be integrated into the electrical inlet.

BATTERY CONDITIONER DISPLAY LOCATION
The battery conditioner display shall be integrated into the electrical inlet and located via the electrical inlet location 5209 subcategory.

AUXILIARY AIR COMPRESSOR

A Kussmaul Pump 12V 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 cab over the wheel well.

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 is connected to.

Amp Draw Reference List:
Kussmaul 40 LPC Charger - 5 Amps
Kussmaul Chief 4012 Charger – 5.7 Amps
Kussmaul 80 LPC Charger - 13 Amps
Kussmaul Chief 6012 Charger - 9 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.

ELECTRICAL INLET COLOR
The electrical inlet connection shall include a **RED** cover.

HEADLIGHTS
The cab front shall include four (4) rectangular 4x6 FireTech LED Headlights.

HEADLIGHT LOCATION
The headlights shall be located on the front fascia of the cab directly above the front warning lights.

FRONT TURN SIGNALS
The front fascia shall include two (2) Whelen model 600 4.00 inch X 6.00 inch programmable amber LED turn signals, which shall be installed in a polished aluminum 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) marker lamps on the front of the vehicle designating identification and clearance. There shall be five (5) face-mounted lights integrated into the scene light.

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.

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.

LIGHTBAR PROVISION
There shall be one (1) light bar installed on the cab roof. The light bar shall be provided and installed by the chassis manufacturer. The light bar installation shall include a lowered mounting that shall place the light bar just above the junction box and wiring to a control switch on the cab dash.

CAB FRONT LIGHTBAR MODEL
The cab shall be provided with one (1) Whelen model F4N72 light bar. The light bar shall be 72.00 inches in length and feature eighteen (18) customizable pods.

See the light bar layout for specific details.

LIGHTBAR SWITCH
The light bar shall be controlled through a virtual button on the vehicle display and control screen. There shall be an additional button located on the vehicle display and control screen to control the clear lights.

FRONT SCENE LIGHTS
The front of the cab shall include one (1) HiViz model FireTech FT-B-72-ML-B LED scene light installed on the brow of the cab. The light shall feature (5) five integrated marker lights. The housing shall be powder coated black.

FRONT SCENE LIGHT LOCATION
There shall be one (1) scene light mounted center on the front brow of the cab.

FRONT SCENE LIGHTS ACTIVATION
The front scene lighting shall be activated by individual lighted momentary rocker switches for each of the three (3) separate scene lighting circuits. Each circuit shall be activated independently and shall include rocker switches labeled “Front Scene”, “Front Flood”, and “Front Spotlight”.

SIDE SCENE LIGHTS
The cab shall include two (2) FireTech Guardian Elite LED surface mount lights installed one (1) on each side of the cab.

SIDE SCENE LIGHT LOCATION
The scene lighting located on the left and right sides of the cab shall be mounted rearward of the cab “B” pillar in the 10.00 inch raised roof portion of the cab between the front and rear crew doors.

SIDE SCENE ACTIVATION
The scene lights shall be activated by two (2) lighted momentary rocker switches located in the switch panel, one (1) for each light, and by opening the respective side cab doors. The switches shall be labeled “Right Scene” and “Left Scene”.

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 that 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 vehicle display and control screen.

UNDER BUMPER LIGHTS
There shall be two (2) 4.00 inch round LED ground lights mounted under the bumper. The lights shall include a polycarbonate lens, a housing that is vibration welded, and LEDs, which shall be shock, mounted for extended life. 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 that 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.

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 a flashing red TecNiq K50 LED light clearly labeled "Do Not Move Apparatus". In addition to the flashing red light, an audible alarm shall be included which shall sound while the light is activated.

The flashing red light shall be located centered left to right for greatest visibility.

The light and alarm shall be interlocked for activation when either a cab door is not firmly closed, or an apparatus compartment door is not closed, and the parking brake is released.

MASTER WARNING SWITCH
A red 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.

HEADLIGHT FLASHER
An alternating high beam headlight flashing system shall be installed into the high beam headlight circuit which shall allow the high beams to flash alternately from left to right.

Deliberate operator selection of high beams will override the flashing function until low beams are again selected. Per NFPA, these clear flashing lights will also be disabled “On Scene” when the park brake is applied.

HEADLIGHT FLASHER SWITCH
The flashing headlights shall be activated through a virtual button on the Vista display and control screen.

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 the master warning switch.

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 bumper in the rearward position.

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 directly over the center of the front axle.

SIDE AND INTERSECTION WARNING SWITCH
The side warning lights shall be controlled through the master warning switch.

TANK LEVEL LIGHTS
There shall be two (2) Whelen Strip-Light Plus XL tank lights surface mounted within a chrome bezel. The Lights will be mounted vertically on both sides of the cab behind the rear door.

The light strips shall feature four (4) colors of LED lights to indicate the fluid level of a tank. The lights shall change in color to indicate the water level of the tank in ¼ tank increments; the colors shall change from green indicating a full tank to blue, amber, and red as the tank level drops.

TANK LEVEL LIGHTS ACTIVATION
An FRC remote large light driver shall be installed under the dash with the signal wire for the primary display routed to the rear of cab on the chassis.

The light activation shall be active with the park brake set and ignition on.

TANK LEVEL LIGHTS LOCATION

There shall be water level lights mounted on each side of the cab, behind the rear cab doors.

INTERIOR DOOR OPEN WARNING LIGHTS
The interior of each door shall include one (1) red 4.00-inch diameter Tecniq T40 LED warning light located on the door panel. Each light shall activate with a flashing pattern when the door is in the open position to serve as a warning to oncoming traffic.

The interior of each door shall include one (1) Weldon 15" amber directional flashing LED surface mounted light located above the window.

SIREN CONTROL HEAD
A Powercall UDX7 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, Powercall 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 allow control of the electric horn, the air horn, or the mechanical siren from the steering wheel horn button.

AUDIBLE WARNING LH AND RH 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 AND 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 located on the right hand side accessible to the officer.

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.

AIR HORN ACTIVATION
There shall be two (2) pull chains to activate the air horns inside the cab. Pull chains shall be located on the ceiling of the cab. One (1) shall be located on the driver's side and one (1) shall be located on the officer's side.

AIR HORN AUXILIARY ACTIVATION
The air horn activation shall be accomplished by a **RED** momentary back lit push button on the switch panel. An air horn activation circuit shall be provided to the chassis harness pump panel harness connector.

MECHANICAL SIREN BRAKE/AUXILIARY ACTIVATION
A red momentary siren brake rocker switch shall be provided in the switch panel on the dash.

MECHANICAL SIREN INTERLOCK
The siren activation shall be interlocked with the park brake and 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 light bar 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 zero to 100 MPH, and the secondary scale on the speedometer shall read from zero 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 1/8th 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 zero to

3000 RPM. The scale on the air pressure gauges shall read from zero 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 zero 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 light bar shall be split with fourteen (14) indicators on each side of the LCD message screen. The light bar 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
OK to Pump - indicates the pump is engaged and conditions have been met for pump operations
Pump Engaged - indicates the pump transmission is currently in pump gear
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.

RADIO
A Jensen brand heavy-duty radio with weather band, AM/FM stereo receiver and Bluetooth capabilities shall be installed in a customer specified location. Radio shall be the current, commercially available heavy-duty single-DIN automotive model at time of vehicle manufacturing date.

RADIO LOCATION
The radio shall be installed in the left hand overhead position above the driver, offset to the right hand side.

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 and two (2) speakers installed in the rear portion of the cab overhead. The speakers shall be provided for connection to the sound system.

RADIO CUTOFF
The radio shall cut-out with the activation of the Master warn switch.

CAMERA REAR
One (1) Audiovox Voyager heavy-duty box shaped HD camera shall be installed in the body and will 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 a single vehicle display and control screen located on the driver's side dash. The camera system display can be activated through the vehicle display and control screen.

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 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 an Antenex model MABVT8 made for either a 0.38-inch or 0.75 inch receiving hole in the antenna and shall include 17 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.

COMMUNITATIONS SPEAKERS
Four (4) communication speakers shall be installed in the cab. One (1) over both the driver and officer's seat and two (2) in the rear of the cab overhead.

COMMUNICATION ANTENNA CABLE ROUTING
The antenna cable shall be routed from the antenna base mounted on the roof to the area behind and underneath the right hand front seat.

AUXILIARY COMMUNICATION ANTENNA

An auxiliary 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 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 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 behind and underneath the right hand front seat.

FIRE EXTINGUISHER
A 2.50-pound D.O.T approved fire extinguisher with BC rating shall be shipped loose with the cab.

DOOR KEYS
The cab and chassis shall include four (4) door keys for the manual door locks.

WARRANTY
Purchaser shall receive a Custom Chassis Two (2) Years or 36,000 Miles limited warranty in accordance with, and subject to, warranty certificate RFW0102. 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

CAB/CHASSIS AS BUILT WIRING DIAGRAMS
The cab and chassis shall include two (2) digital copies of wiring schematics and option wiring diagrams.

DRIVELINE LAYOUT CONFIRMATION
During the design phase of the chassis the Manufactures Chassis driveline engineer shall submit the driveline layout to an OEM engineer to review the chassis design for any potential problems integrating the OEM body to the chassis. This shall also include review and approval of requested clear areas. The OEM engineer shall provide approval to the driveline engineer prior to driveline bills of materials being released.

CHASSIS MODIFICATIONS

EXHAUST HEAT SHIELD
The chassis horizontal exhaust pipe shall be equipped with a stainless steel heat shield to protect the body compartments.

The exhaust pipe shall discharge engine exhaust to the right side of the apparatus.

MUD FLAPS
Heavy-duty black rubber mud flaps shall be provided behind the front tires.

One (1) Box Alarm Grilles full width black, anti-sail mud flap shall be installed behind the rear wheels. This mud flap shall have reflective red lettering with reflective grey outline. The lettering shall read as follows: ENG # INE

REAR TOW BAR
A two inch diameter, solid steel bar shall be suspended approximately 28" below the top of the rear chassis frame rail.

The tow bar shall be attached to the frame rail at each side using properly reinforced channel supports.

Tow bars that are attached to both the frame rails and the apparatus body will not be acceptable, due to undue stresses on the body, caused when the chassis frame flexes.

HELMET STORAGE
The helmets will be stored in a compartment as specified by the purchaser at pre-paint inspection.

FUEL FILL
The fuel fill for the custom chassis shall be located in the left side rear fender area, and shall have a painted stainless steel door, labeled: "DIESEL FUEL ONLY".

CAB TILT CONTROL
A cab-tilt pendant control shall be provided and installed on the right side of the apparatus. The pendant shall be located directly behind the upper auxiliary pump access panel.

A cab tilt instruction plate shall be located as close as possible to the control pendant for ease of operation.

CAMERA MOUNTING
The body builder shall mount the chassis-supplied camera on the rear of the body.

PUMP CONTROL
Provisions shall be made for placing the pump drive system in operation, using controls and switches that are identified, and within convenient reach of the operator.

A "PUMP ENGAGED" indicator shall be provided in the driving compartment and on the operator's panel to indicate that the pump shift process has been successfully completed. An "OK TO PUMP" indicator shall be provided in the driving compartment to indicate that the pump is engaged, the chassis transmission is in pump gear, and the parking brake is engaged.

The fire pump-shift system shall be equipped with a means to prevent unintentional movement of the control device from its set position. The system shall include a nameplate, indicating the chassis transmission shift selector position to be used for pumping, and located so that it can be easily read from the driver's position.

The system shall include the applicable NFPA standard interlocks, pump shift, and "OK TO PUMP" indicator lights in the cab and at the pump panel. The fire pump system shall be equipped with an interlock system to ensure that the pump drive system components are properly engaged in the pumping mode of operation, so that the pumping system can be safely operated from the pump operator's position.

If applicable, the secondary braking device shall be automatically disengaged for pumping operations.

PUMP AND PLUMBING
WATEROUS 1750 or 2000 GPM SINGLE-STAGE MIDSHIP PUMP

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

- 100% of rated capacity at 150 PSI net pump pressure
- 100% of rated capacity at 165 PSI net pump pressure
- 70% of rated capacity at 200 PSI net pump pressure
- 50% of rated capacity at 250 PSI net pump pressure

DETAILED SPECIFICATIONS
Pump Assembly
1. The pump shall be of a size and design to mount on the chassis rails of commercial and custom truck chassis and have the capacity of 1750 or 2000 gallons per minute (U.S. GPM), NFPA-1900 rated performance.
2. The entire pump shall be assembled and tested at the pump manufacturer's factory.
3. The pump shall be driven by a driveline from the truck transmission. The engine shall provide sufficient horsepower and RPM to enable pump to meet and exceed its rated performance.
4. The entire pump, both suction and discharge passages, shall be hydrostatically tested to a pressure of 600 PSI. The pump shall be fully tested at the pump manufacturer's factory to the performance spots as outlined by the latest NFPA 1900 standard. Pump shall be free from objectionable pulsation and vibration.
5. The pump body and related parts shall be of fine grain alloy cast iron, with a minimum tensile strength of 30,000 PSI (2069 bar). All metal moving parts in contact with water shall be of high quality bronze or stainless steel. Pump utilizing castings made of lower tensile strength cast iron is not acceptable.
6. Pump body shall be horizontally split on a single plane in two sections for easy removal of entire impeller assembly including wear rings and bearings from beneath the pump without disturbing piping or the mounting of the pump in chassis.
7. The pump body shall extend as one piece across the truck chassis from side to side and incorporate discharge manifolding with a minimum of (12) 4” ports and (7) 3” port.
8. The pump shall have one double suction impeller. The pump body shall have two opposed discharge volute cutwaters to eliminate radial unbalance. (No exceptions)
9. Pump shaft to be rigidly supported by three bearings for minimum deflection. One high lead bronze sleeve bearing to be located immediately adjacent to the impeller (on

side opposite the gearbox). The sleeve bearing is to be lubricated by a force-fed, automatic oil lubricated design, pressure balanced to exclude foreign material. (No exceptions.) The remaining bearings shall be heavy-duty, deep groove ball bearings in the gearbox and they shall be splash lubricated.
10. Packing - The pump shaft shall have only one packing gland located on the inlet side of the pump. It shall be of split design for ease of repacking. The packing gland must be a full-circle threaded design to exert uniform pressure on packing and to prevent "cocking" and uneven packing load when it is tightened. (No exceptions.) It shall be easily adjusted by hand with rod or screwdriver without special tools or wrenches required. The packing rings shall be of a unique, permanently lubricated, long-life graphic composition and have sacrificial zinc foil separators to protect the pump shaft from galvanic corrosion. (No exceptions.)

(OR)

10. Mechanical Seal - One (1) only required on the suction (inboard) side of the pump. The mechanical seal must be two (2) inches in diameter and shall be spring loaded, maintenance free and self-adjusting. Mechanical seal construction shall be a carbon-sealing ring, stainless steel coil spring, Viton rubber cup, and a tungsten carbide seat with Teflon backup seal.
11. Pump impeller shall be hard, fine grain bronze of the mixed flow design, accurately machined and individually balanced. The vanes of the impeller intake eyes shall be of sufficient size and design to provide ample reserve capacity utilizing minimum horsepower.
12. Impeller clearance rings shall be bronze, easily renewable without replacing impeller or pump volute body, and of wrap-around double labyrinth design for maximum efficiency. (No exceptions.)
13. The pump shaft shall be heat-treated, electric furnace, corrosion resistant stainless steel to be super-finished under for longer shaft life. Pump shaft must be sealed with double-lip oil seal to keep road dirt and water out of gearbox.

Gearbox – G Gearbox
1. Pump gearbox shall be of sufficient size to withstand up to 16,000 lbs. ft. of drive through torque of the engine system. The drive unit shall be designed of ample capacity for lubrication reserve and to maintain the proper operating temperature.
2. The gearbox drive shafts shall be of heat-treated chrome nickel steel and at least 2-3/4 inches in diameter, on both the input and output drive shafts. They shall withstand the full torque of the engine.
3. All gears, both drive and pump, shall be of the highest quality electric furnace chrome nickel steel. Bores shall be ground to size and teeth integrated and hardened, to give an extremely accurate gear for long life, smooth, quiet running, and higher load carrying capability. An accurately cut spur design shall be provided to eliminate all possible end thrust. (No exceptions.)
4. The pump ratio shall be selected by the apparatus manufacturer to give maximum performance with the engine and transmission selected.
5. If the gearbox is equipped with a power shift, the shifting mechanism shall be a heat-treated, hard-anodized aluminum power cylinder, with stainless steel shaft. An in-cab control for rapid shift shall be provided that locks in road or pump.
6. For automatic transmissions, three green warning lights shall be provided to indicate to the operator(s) when the pump has completed the shift from Road to Pump position. Two green lights to be located in the trucks driving compartment and one

green light on pump operator's panel adjacent to the throttle control. For manual transmissions, one green warning light will be provided for the driving compartment. All lights to have appropriate identification/instruction plates.

WATEROUS ANODE SYSTEM
Two (2) Waterous anodes shall be installed in the pump to prevent damage caused by galvanic corrosion within the pump.

One (1) installed in the suction side of the pump and one (1) installed in the discharge side of the pump.

The anodes should be inspected every 12 months and replaced when over 75% of the zinc has been consumed. Performance of the anode life will vary with water quality and PH.

AUTOMATIC FIRE PUMP PRIMING SYSTEM – MULTI-LOCATION
A Trident Model #31.011.23 automatic multi-location air-operated priming system shall be installed. The unit shall be of all brass and stainless steel construction and designed for fire pumps of 1,250 GPM (4,690 LPM) or more. Due to corrosion exposure, no aluminum or vanes shall be used in the primer design. The primer shall be a three-barrel design with ¾" NPT connection to the fire pump.

The primer shall be mounted above the pump impeller so that the priming line will automatically drain back to the pump. The primer shall automatically drain when the panel control actuator is not in operation. The inlet side of the primer shall include a brass 'wye' type strainer with removable stainless steel fine-mesh strainer to prevent entry of debris into the primer body.

AUTOMATIC PRIMER CONTROL WITH VACUUM GAUGE PANEL
The 12-volt primer control shall be an automatic-type, with a pump panel three-way switch to operate an air solenoid valve. The panel switch shall operate a 12-volt solenoid to direct air pressure from the air brake system to prime the pump. To prevent freezing, no water shall enter the primer valve control.

A vacuum gauge, 2" in diameter, with graduations from zero to 30 feet, shall be installed in the primer control panel. The gauge shall be physically connected to the vacuum side of the primer, and read only when the primer is running, so it will never see or be subject to damage from high pump intake pressures.

The automatic priming switch shall have three positions as follows:

- ***Prime*** **-** the lower position shall be a momentary "push to prime". The "Prime" position also allows the operator to "ramp" test the primer without the fire pump being engaged.

- ***Off*** - center position

- **Auto-Prime -** in the upper position, a green LED pilot light shall be illuminated when the switch is in the "Auto-Prime" position. The *Auto-Prime* operates automatically when the pump pressure drops below 20 PSIG. The primer shuts

off automatically when the pump pressure is re-established, and exceeds 20 PSIG. The *auto* mode only operates when the fire pump is engaged.

Three (3) additional push-to-prime remote primer controls shall be installed on the panel for the specified suction intakes. The additional controls shall operate the air primer to pre-prime and may be used to remove air from the auxiliary intake piping and hose, while the fire pump is operating. To prevent freezing, no water shall enter the primer valve control.

Warranty - The primer shall be covered by a five (5) year parts warranty.

TRIDENT AUTO PRIME FRONT SUCTION PREP
The front suction pipe shall be equipped with the necessary plumbing to enable it to be primed independently of the pump and other suction inlets by the Trident air primer.

PRESSURE GOVERNOR
A FRC Pump Boss Max pressure governor shall be installed at the pump panel.

PIPING
All piping shall be heavy-duty, 304 grade, schedule 10 stainless steel or Class 1 high-pressure flexible hose. All stainless steel fittings shall be threaded or welded.

Class 1 flexible hose shall be Black SBR synthetic rubber hose with 300# working and 1200# burst pressure, with stainless steel fittings.

Whenever possible, sweep-type elbows shall be utilized, in order to reduce friction loss. Thread-in 45's and 90's will be used elsewhere.

Victaulic or rubber couplings shall be used, where necessary, to allow flexing of plumbing, which will prevent damage or loosening of the piping, which can occur with rigid plumbing.

All threaded joints shall have non-hardening type sealant for easy removal for repairs.

All piping, including intake and discharge lines, shall be hydrostatically tested. A vacuum test shall be applied to the pump, plumbing, and valves, to test for leaks. The system shall be tested and shall show minimum loss of no more than 10 inches of vacuum over a 5-minute period, as required by NFPA 1900, 2024 edition, section 15.13.6.4.

SYNFLEX SUCTION, DISCHARGE, PRESSURE, AND CONTROL LINES
Small lines within the pump enclosure shall be constructed from Synflex hose. Uses include, but are not limited to, such lines as priming control, gauge lines, drain lines, air control valves, pump shift, supplemental cooling, foam flush, and air bleeder valves.

FIRE PUMP & PLUMBING SYSTEM PAINTING
The fire pump and plumbing system shall be painted job color, or the lower color when a two-paint scheme is specified. No exceptions.

AKRON VALVES
All pump intake and discharge valves shall be *AKRON 8000* heavy-duty swing-out series. The valves shall have an all-brass body with flow-optimizing stainless steel ball, and dual-polymer seats. The valves shall be capable of dual-directional flow, while incorporating a self-locking ball feature, using an automatic friction lock design, and specially designed flow-optimizing stainless steel ball. All stainless steel parts must be 316 grade for increased resistance to corrosion. The valve shall not require the lubrication of seats or any other internal waterway parts and be capable of swinging out of the waterway for maintenance by the removal of six bolts. The valves shall carry a ten (10) year manufacturer's warranty. The valve shall be manufactured and assembled in the United States.

INTAKE RELIEF VALVE
An Elkhart Brass intake relief valve shall be installed on the suction side of the pump. The valve shall be the preset type at 125 PSI and is adjustable from 75 to 250 PSI and shall be designed to prevent vibration from altering the setting. The relief outlet shall be directed below the pump with the discharge terminating in a 2-1/2" male NST connection. The discharge shall be away from the pump operator and labeled "Do Not Cap".

U.L. PUMP & VOLTAGE CERTIFICATION TEST
One (1) certification test shall be performed at the manufacturer's on-site testing facility, by Underwriters Laboratories.

The certification shall include at minimum:

- Pumping test - NFPA 13.13.2
- Pumping engine overload test – NFPA 3.13.3
- Pressure control system test - NFPA 13.13.4
- Priming system tests - NFPA 13.13.5
- Vacuum test - NFPA 13.13.6
- Water tank-to-pump flow test - NFPA 13.13.7
- If the pump is driven by the chassis engine: engine speed advancement interlock test – NFPA 13.13.8
- Gauge and flowmeter test – NFPA 13.13.9
- Low voltage - NFPA 10.13
- Line voltage - NFPA 21.13.3

A test plate shall be provided at the pump operator's position that gives the rated discharges and pressures, together with the speed of the engine, as determined by the certification test. The plate shall be completely engraved with all information at the factory and attached to the vehicle prior to delivery. The original U.L. certificate shall be provided upon acceptance and payment of the apparatus in full.

VENTED LUG CAPS AND PLUGS
All intake and discharge plugs and caps shall be vented-lug type, designed to relieve trapped pressure and help reduce possible operator injuries.

STEAMER INLETS

Two (2) 6" steamer inlets shall be provided on the pump panels, one (1) on the left side, and one (1) on the right side.

Both inlets shall have screens and chrome caps with long handles.

FRONT SUCTION
Front suction piping shall be provided, that will terminate horizontally through the front of front extended bumper.

This line shall have Victaulic type couplings, front and rear, with drains located, where necessary, at the lowest points of the piping.

The suction shall utilize 5" stainless steel piping, (installed by the chassis manufacturer,) and shall extend from the right front bumper to the back of the cab.

The body manufacturer shall continue the plumbing to the right suction side of the pump.
The suction shall be controlled by a 6" Waterous MIV-E electric-operated butterfly valve. The valve shall be controlled at the pump operator's panel.

The suction shall terminate with a Trident 5" Female NPT x 6" Male NH with removable screen and long handled chrome-plated cap.

TWO (2) WATEROUS (MIV-E) ELECTRIC MASTER INTAKE VALVES
Both the left and right side suction inlets shall be equipped with a full-flow butterfly-type valve, designed to mount on the fire pump, between the suction tube extension and suction tube, behind the pump compartment panel. The entire valve shall be cast, manufactured, and tested at the pump manufacturer's factory.

When the valve is installed in the fire pump suction, the fire pump shall be capable of achieving an NFPA / UL test rating of 1750 or 2000 GPM through a single 6-inch NST suction hose.

A pressure relief valve shall be provided that is factory pre-set to 125 PSI (9 BAR) and field- adjustable from 75 to 250 PSI (5 to 17 BAR). The pressure relief valve shall provide over- pressure protection for the suction hose, even when the intake valve is closed.

An integral relief valve-mounting pad shall be provided on the valve body. This mounting pad shall provide a type 115 4-3/8 inch bolt circle flange for normal installation. The mounting pad shall have 2-1/2 inch female NPT threads to permit remote mounting of the relief valve, without special adapters.

The outlet of the pressure relief valve shall have 2-1/2 inch NPT threads to allow directing the discharge flow away from the pump operator position.

The inlet valves shall be operated by a 12 VDC electric motor with remote override handwheel, located next to the suction tube.

Each valve shall be provided with panel placards indicating control operation. The placards shall have status lights to indicate whether the valve is open, closed, or

traversing from one position to another. Each valve shall be provided with a gear actuator that will cycle the valve from OPEN to CLOSED position in no less than 3 seconds.

The gear actuators shall be sealed units, designed to provide reliable service in the harsh pump compartment environment. The ratio of the gear actuator shall be such that the handwheel will close the valve in no more than 10 complete turns.

The 12 VDC motor on the electric operated valve shall be provided with an automatic-resetting, thermally compensated, over-current protection circuit breaker, to protect the 12 VDC motor and apparatus electrical system.

The valve body shall have a 3/4 inch female NPT threaded port on the top to allow installation of an NFPA compliant large diameter hose air bleeder valve.

The air bleeder valve shall be mounted on the operator panel and be controllable by the pump operator.

The valve body shall have a 1/4 inch female NPT threaded port on the bottom to permit connection of an individual water drain valve.

A suction tube extension 7-1/4 inches wide shall be used to allow for the additional length of the inlet valve.

The shorter suction tube extension, along with a 4, 6, or 9-inch suction tube, will keep the suction tube threads within the apparatus running boards while maintaining clearance for adapters.

A panel mounted manual override shall be provided to permit operation of the electric remote control valve in the event of abnormal operating conditions.

The manual override shall be designed to permit operation of the valve without the use of special tools or disassembly of the pump compartment panel or valve.

SUCTION - LEFT SIDE
One (1) 2-1/2" suction valve shall be installed on the left side of the unit. The valve body shall be mounted behind the pump panel, with a 2-1/2" NST chrome inlet swivel, chrome plug and chain, and removable inlet strainer.

SUCTION - RIGHT SIDE
One (1) 2-1/2" suction valve shall be installed on the right side of the unit. The valve body shall be mounted behind the pump panel, with a 2-1/2" NST chrome inlet swivel, chrome plug and chain, and removable inlet strainer.

TANK TO PUMP
There shall be one (1) 3" gated tank to pump line, piped to the tank sump.

Piping from the sump to the valve shall be 4" diameter.

The line shall be plumbed directly into the back of the pump for maximum efficiency.

A full-flow, inline ball valve, with check valve, shall be provided to prevent accidental pressurization of the water tank through the pump connection.

The valve shall be electric activated, with control located on the pump panel.

TANK FILL - 2-1/2"
There shall be a 2" tank refill line installed, with a 2" inline valve.

Valve shall be controlled at the pump operator's panel and will be clearly marked "TANK REFILL/PUMP COOLER".

CROSSLAY HOSEBEDS W/ 2" PLUMBING
Two (2) cross lays shall be installed over the pump compartment as low as possible.

Each section of the cross lay shall be capable of holding 200' of 1.75" double-jacketed hose, in a double-stack load.

A 2" mechanical swivel with 1.5" NST hose connector shall be used in each cross lay, to allow deployment of hose in either direction.

Stainless steel rollers with nylon guides shall be mounted on both ends, and below the cross lays.

A 1/4" aluminum divider shall separate the cross lays, and poly-plas matting shall be used on the stainless steel cross lay floor.

Each cross lay shall be plumbed with 2" piping and a 2" valve and shall be controlled at the operator's panel.

CROSSLAY LID
A polished aluminum diamond plate lid shall be provided over the cross lay(s).

The lid shall have full-length stainless steel hinge with Velcro straps to hold lid firmly in place.

CROSSLAY NETTING
Black netting shall be installed on each end of the cross lay to retain the hose load. The netting shall be secured with 2" wide straps with quick disconnect buckles.

Meets NFPA 1900, 2024 edition, section 12.9.6 - Any hose storage area shall be equipped with a positive means to prevent unintentional deployment of the hose from the top, side, front, and rear of the hose storage area while the apparatus is underway in normal operations.

DUNNAGE COMPARTMENT
The remaining area behind the cross lay(s) shall be used for additional storage space.

DUNNAGE COMPARTMENT
Each side of the dunnage compartment shall be enclosed with 12-gauge satin-finish stainless steel.

SUMP BOX
The left side running board shall have a 12-gauge stainless steel sump box, as large as possible.

The sump box shall have matting and drain holes in the floor of the compartment.

It shall be capable of holding 20 feet of 5-inch supply hose.

The hose shall be secured with straps to prevent unintentional deployment of the hose, per NFPA 1900, 2024 edition, section 12.9.6.

SUMP BOX
The right side running board shall have a 12-gauge stainless steel sump box, as large as possible.

The sump box shall have matting and drain holes in the floor of the compartment.

It shall be capable of holding 50 feet of 3-inch supply hose.

The hose shall be secured with straps to prevent unintentional deployment of the hose, per NFPA 1900, 2024 edition, section 12.9.6.

DISCHARGES - 2.5" LEFT SIDE

Two (2) 2.5" discharges shall be located on the left side pump panel and shall be controlled from the operator's panel.

Each discharge shall terminate with a 2.5" NST 30 degree turndown then reduced to 1.5” with chrome cap and retainer chain.

DISCHARGE - 2.5" RIGHT SIDE
One (2) 2.5" discharge shall be located on the right side pump panel, and shall be controlled from the operator's panel.

The discharge shall terminate with a 2.5" NST 30 degree turndown then reduced to 1.5” with chrome cap and retainer chain.

DISCHARGE - 4" RIGHT SIDE - 5" STORZ
One (1) 4" discharge with a 4” valve shall be located on the right side pump panel, and shall be controlled from the operator's panel.

The discharge shall terminate with a 4" NST x 5" 30-degree Storz adapter, with blind cap and retainer chain.

DISCHARGE - 2.5 LEFT REAR HOSEBED
One (1) discharge shall be piped to the left rear of the hose bed and shall be controlled from the operators panel

The discharge shall terminate with 3" female NST x 2.5" 30-degree turn- down, with chrome cap and retainer chain.

DISCHARGE - 3” LEFT AND RIGHT REAR HOSEBED
Two (2) 3" discharge shall be piped to the left and right rear of the hose bed and shall be controlled from the operator's panel.

The discharge shall terminate with 3" female NST x 2.5" 30-degree turn- down, with chrome cap and retainer chain.

DISCHARGE - DELUGE GUN
One (1) Elkhart Brass Vulcan monitor (8500-02) equipped with an Elkhart Brass Stream Shaper (282-A) and Elkhart Brass Stacked Tips (ST-194) shall be piped to the dunnage area of the apparatus.

The stacked tips and stream shaper shall be shipped loose.

The deluge gun shall be equipped with a riser that allows the deluge gun to raise just above the roof of the cab.

AKRON SLO-CLOZ
An Akron Slo-Cloz device shall be provided on each 3" or 4” discharge valve, to limit the opening of the valve to no faster than 3 seconds, per N.F.P.A. specifications.

The hydraulic device shall be operable from -40 deg. F to 140 deg. F.

The device shall be made of corrosion-resistant materials and shall not add more than 1-1/2" to the valve height.

PUMP MASTER DRAIN
The pump shall be equipped with a Trident master drain that will have the capacity to drain all lines and main pump at the same time. The master drain will be mounted on the left side panel and will be readily accessible.

DRAIN VALVES
All side discharges and auxiliary suction drain valves shall be *Innovative Controls* 3/4" ball brass drain valves with chrome-plated lift lever handles and ergonomic grips. Each lift handle grip shall feature built-in color-coding labels and a verbiage tag, also supplied by *Innovative Controls*, identifying each valve. The colors labels shall also include valve open and close verbiage. The drain valves shall be located in the lower portion of the pump panels. All other discharges shall have *Class 1* brand 3/4" automatic bleeder drains.

ENGINE COOLER
The supplementary heat exchanger cooling system supplied on the chassis shall be completed to the pump panel, to permit water from the discharge side of the pump to be circulated through the engine cooling system.

Coolant inlet and outlet shall be continuous, preventing intermixing of engine coolant and pump water.

The heat exchanger shall be of brass construction, with control valve located on operator's panel.

OFF-TRUCK FOAM ACCESS KIT
An Akron model 3128 foam access kit shall be provided, which operates through the metering panel with a quick connect fitting and cap.

A 6' quick connect pickup tube will be provided, which allows off-truck foam access from pails.

PUMP PANEL AND ACCESSORIES
INDEPENDENT PUMP MODULE
The pump module shall be a self-supported structure, mounted independently from the body and chassis cab. The pump module shall be fabricated and constructed from the same material as the body. The design shall allow for normal frame deflection, without imposing stress on the pump module structure. The pump module shall consist of a welded, tubular, stainless steel framework, properly braced, to withstand chassis frame flexing. The pump module shall be bolted to the chassis frame rails.

SIDE MOUNTED OPERATOR'S PANEL
CONSTRUCTION
The pump house shall be a properly supported structure, mounted between the body and chassis cab, and shall be bolted to the chassis frame rails. The panel shall be supported by 1-1/2" stainless steel tubing.

The pump, and all of the pump-mounted valves, shall be completely enclosed by the pump house design.

The pump panels shall be coated with black Bedliner Coating for maximum resistance to abrasion and to minimize glare. The material shall be capable of withstanding the effects of extreme temperatures and weather.

The left side of the pump house shall consist of an upper, hinged panel containing all required gauges.

The lower panel shall contain left side specified discharges, inlets, drains, and pump controls.

The upper right side of the pump house shall consist of double, vertically hinged access doors. The doors will be swing-open-style with quick-opening latches.

A separate, lower panel shall contain the specified right side-mounted discharges and inlets, and their respective drains.

The bottom panel shall be fastened to the pump house with stainless steel bolts and shall be completely removable.

INNOVATIVE CONTROLS PUSH/PULL VALVE CONTROL HANDLES

For valve actuation, the apparatus pump panel shall be equipped with *Innovative Controls* side- mount valve controls.

The ergonomically designed, push-pull T-handle shall be chrome-plated zinc with recessed labels for color-coding and verbiage. The control rod, double laminated locking clips, and rod housing shall be stainless steel, and shall provide a true, positive lock that will eliminate valve drift. Bronze and Teflon-impregnated stainless steel bushings, in both ends of rod housing, shall minimize rod deflection, never need lubrication, and ensure consistent, long-term operation. Where required, locking, quarter-turn, push-pull, T-handle controls will be provided.

The control assembly shall include a decorative, chrome-plated, zinc, panel-mounting bezel and four (4) mounting bolts.

IDENTIFICATION LABELS FOR PUMP PANEL
Innovative Controls verbiage label bezels shall be installed. The bezel assemblies will be used to identify apparatus components. These labels shall be designed and manufactured to withstand the specified apparatus service environment.

The verbiage label bezel assemblies shall include a chrome-plated, panel-mount bezel with durable, easy-to-read, UV-resistant, polycarbonate inserts, featuring the specified verbiage and color-coding. The UV-resistant, polycarbonate verbiage and color inserts shall be sub-surface screen printed to eliminate the possibility of wear and protect the inks from fading. Both the insert labels and bezel shall be backed with 3M permanent adhesive (200MP), which meets UL969 and NFPA standards.

SIDE MOUNTED OPERATOR'S PANEL
The following items shall be located on the left side pump panel:

- Individual 0-400# compound discharge gauges shall be provided for each 1.5" or larger discharge
- One (1) -30 to 400 psi master pressure gauge
- One (1) -30 to 400 psi master vacuum gauge
- One (1) engine oil pressure gauge with audible & visual alarm
- One (1) engine water temperature gauge with audible & visual alarm
- One (1) engine voltmeter
- One (1) waterproof engine tachometer
- Two (2) UL test connections
- One (1) master pump house lighting switch
- One (1) engine throttle control
- One (1) relief valve control and open indicator light
- One (1) primer control
- All discharge controls
- One (1) tank fill/pump bypass control
- One (1) tank to pump valve control
- One (1) pump ENGAGED indicator light
- One pump certification plate
- One liquid level meter with sensor in the water tank

RUNNING BOARDS

Running boards shall be provided on each side of the pump module, which shall extend from the front of the side compartments, forward to the back of the cab. Running boards shall be covered with 1/8" aluminum diamond plate. The inboard edge shall be formed upward 1-1/2", to provide a kick strip along the bottom of the pump panel. The outer edge shall be bent downward to provide a safety rail.

Running boards are supported by 1.50" structural stainless steel tubing, welded to the pump house framing, and shall be able to support a minimum of 500 pounds. The running board stepping surface will comply with the latest version of NFPA 1900.

PANEL LIGHTING
The side-mount pump panel shall be illuminated by four (4) TecNiq (model E10-W000-1) 6.00" LED lights with clear lens.

Lights shall be mounted across the top of the gauge panel, and shall be protected by a full width, polished stainless steel shield.

Lights are controlled by a panel-mounted master light switch.

One (1) side pump panel light shall illuminate green when the pump is shifted into gear from inside the cab, affording the operator illumination when first approaching the control panel.

4.0" INNOVATIVE CONTROLS MASTER GAUGES
The master intake and master discharge gauges shall be 4” diameter Innovative Controls pressure gauges. Each gauge shall have a one-piece nylon case that integrates the valve stem connection, movement support, and bourdon tube support into a single unit that eliminates distortion and leakage. Clear, scratch-resistant, molded crystals with captive O-ring seals shall be used to ensure distortion-free viewing, and to seal the gauge. The gauges shall be filled with a synthetic mixture to dampen shock and vibration, lubricate the internal mechanisms, prevent lens condensation, and ensure proper operation from –40°F to +160°F. Each gauge shall meet ANSI B40.1 Grade 1A requirements with an accuracy of +/- 1%, full scale, and include a size-appropriate, phosphorous-bronze bourdon tube with a reinforced lap joint and large tube base to increase the tube life and gauge accuracy.

A polished stainless steel bezel shall be provided to prevent corrosion and protect the lens and gauge case. The gauges shall be installed into decorative, chrome-plated mounting bezels that incorporate valve-identifying verbiage.

The master gauges shall be installed on the pump panel, no more than 6 inches apart. The gauge on the left shall be the master pump intake gauge and shall display a range from -30 to 400 psi, with black graphics on a white background. The gauge on the right shall be the master pump discharge gauge and shall display a range from -30 to 400 psi, with black graphics on a white background.

2-1/2" INNOVATIVE CONTROLS GAUGES
The valve discharge gauges shall be 2½” diameter Innovative Controls pressure gauges. Each gauge shall have a one-piece nylon case that integrates the valve stem connection, movement support, and bourdon tube support into a single unit that eliminates distortion and leakage. Clear, scratch-resistant, molded crystals with

captive O-ring seals shall be used to ensure distortion free viewing and to seal the gauge. The gauges shall be filled with a synthetic mixture to dampen shock and vibration, lubricate the internal mechanisms, prevent lens condensation, and ensure proper operation from –40°F to +160°F.

Each gauge shall exceed ANSI B40.1 Grade B requirements, with an accuracy of +/- 1.5%, full scale, and shall include a size-appropriate, phosphorous-bronze bourdon tube with a reinforced lap joint and large tube base to increase the tube life and gauge accuracy. A polished stainless steel bezel shall be provided to prevent corrosion and protect the lens and gauge case. The gauges shall be installed into decorative, chrome-plated, mounting bezels that incorporate valve-identifying verbiage and color labels. The gauges shall display a range from zero to 400 psi, with black graphics on a white background.

FLOWMETER AND PRESSURE INDICATOR

Fire Research *Insight Ultimate* model FPA400 series combination digital flowmeter and pressure indicator kit shall be installed. The kit shall include a flowmeter/pressure display module, paddlewheel flow sensor, flow sensor housing with a mount for 1" plumbing, pressure sensor, and interconnecting cables. The display module case shall be waterproof, manufactured of anodized, machined aluminum, and have dimensions not to exceed 4 3/8" high by 4 3/8" wide by 3 1/2" deep. The module shall have a digital LED display for flow with super bright digits more than 3/8" high. Flow rate shall be displayed in GPM. The module shall have an analog display for pressure, with an expanded scale in the normal operating range for more accurate readings. The pressure indicator input and movement shall be electronic. Pressure shall be displayed in PSI.

The flowmeter/pressure indicator program features shall be accessed from the front of the module. The program shall support multiple calibration points for flow and pressure, set points for high and low flow warnings, and flow totalizing functions. The pressure-indicating needle shall be microprocessor controlled. The module shall be able to communicate with other FRC *Insight* flowmeters over a datalink.

Location of combination flowmeter/pressure indicator shall be: All cross lays, front discharge, deck gun, pump panel discharges, rear discharges, and the LDH discharge

ICI WATER LEVEL MONITOR

An Innovative Controls SL-10 Series tank level monitor system shall be installed. The system shall include an electronic display module, a pressure transducer-based sender unit, and a 10' connection cable. The display module shall show the volume of water in the tank using 10 super bright, easy-to-see LEDs. Tank level indication is enhanced by the use of green LEDs at the full and near-full levels, amber LEDs between ¾ and ¼ tank levels, and red LEDs at the near-empty and empty levels. A wide-angle diffusion lens in front of the LEDs creates a 180° viewing angle. The electronic display module shall be waterproof and shock resistant, being encapsulated in a urethane-based potting compound. The potted display module shall be mounted to a chrome-plated, panel-mount bezel with a durable easy-to-read polycarbonate insert, featuring blue graphics and a water icon.

All programming functions shall be accessed and performed from the front of the display module. The programming includes self-diagnostics, manual or self-calibration, and networking capabilities to connect remote slave displays. Low tank level warnings shall include flashing red LEDs, starting below the ¼ level, down-chasing LEDs when the tank is almost empty, and an output for an audible alarm.

The display module shall receive an input signal from a pressure transducer. This stainless steel sender unit shall be installed on the outside of the water tank near the bottom. All wiring, cables, and connectors shall be waterproof without the need for sealing grease.

Location of water tank level monitor shall be on the pump operator's panel.

WHELEN TANK LEVEL LIGHT
There shall be two (2) Whelen Strip-Light Plus XL tank light, surface-mounted within a chrome bezel. The light will be mounted vertically on both sides of the cab behind the rear door.

The light strip shall feature four (4) colors of LED lights, to indicate the fluid level of a tank. The lights shall change in color to indicate the water level of the tank, in ¼ tank increments. The colors shall change from green, indicating a full tank, to blue, amber, and red as the tank level drops.

MICROPHONE COMPARTMENT
A Cast Products microphone compartment with interior dimensions of 6 1/4" wide x 7 3/4" high x 5" deep shall be installed in the pump operator's panel area.

AIR HORN BUTTON ON PANEL
An air horn button shall be installed on the pump operator's panel.

This button will allow pump operator to activate air horns at any point in time. The button will be a waterproof, momentary-contact switch, included in the pump panel light switch bezel. The button shall be **RED** in color, and shall be clearly marked, to distinguish it from other pump panel elements.

SCENE LIGHT SWITCHES ON PANEL
A cluster of switches shall be provide on the pump operator’s panel.

These switches will allow the pump operator to activate the scene lights at any point in time. The switches will be a waterproof rocker style switch. The rocker style switches shall illuminate green when activated.

WATER TANK
The UPF poly water tank shall be constructed of PT3™ polypropylene material. This material shall be a non-corrosive, stress-relieving thermoplastic and shall be UV-stabilized for maximum protection. The tank shell thickness may vary depending on the application and may range from ½” to 1" as required. Internal baffles are generally 3/8" in thickness.

The tank capacity shall be 1000 gallons and will be equipped with a 6" vent/overflow.

TANK CONSTRUCTION
The poly water tank shall be of a specific configuration and is designed to be completely independent of the body and compartments. Joints and seams shall be fused using nitrogen gas, as required and tested, for maximum strength and integrity. The tank construction shall include PolyProSeal™ technology, wherein a sealant shall be installed between the plastic components prior to being fusion-welded. This sealing method will provide a liquid barrier, offering leak protection in the event of a weld compromise. The top of the booster tank is fitted with a removable lifting assembly, designed to facilitate tank removal. The transverse and longitudinal swash partitions shall be manufactured of a minimum of 3/8" PT3™ polypropylene. All partitions shall be equipped with vent and air holes to permit movement of air and water between compartments. The partitions shall be designed to provide maximum water flow. All swash partitions interlock with one another and are completely fused to each other as well as to the walls of the tank. All partitions and spacing shall comply with NFPA 1900. The walls shall be welded to the floor of the tank, providing maximum strength as part of the tank's unique Full Floor Design™. Tolerances in design allow for a maximum variation of 1/8" on all dimensions.

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

TANKNOLOGY™ TAG
A tag shall be installed on the apparatus, in a convenient location, which shall contain pertinent information including a QR code readable by commercially available smart phones. The information contained on the tag shall include:

- The capacity of the water and foam(s)
- The maximum fill and pressure rates
- The serial number of the tank
- The date of manufacture
- The tank manufacturer and contact information

The QR code will allow the user to connect with the tank manufacturer for additional information and assistance.

TANK LID
The tank cover shall be constructed of 1/2" thick PT3™ polypropylene and shall be UV-stabilized to incorporate a multi-piece locking design, which allows for individual removal and inspection if necessary. The tank cover(s) shall be flush or recessed 3/8" from the top of the tank and shall be fused to the tank walls and longitudinal partitions for maximum integrity. Each one of the covers shall have hold-downs consisting of 2" minimum polypropylene dowels, spaced a maximum of 40" apart. These dowels shall extend through the covers and will assist in keeping the covers rigid under fast filling conditions. A minimum of two lifting dowels shall accommodate the necessary lifting hardware.

TANK FILL TOWER

The tank shall have a combination vent and manual fill tower. The fill tower shall be constructed of 1/2" PT3™ polypropylene and shall be a minimum dimension of 12" x 12" outer perimeter. The fill tower shall be black in color, indicating that it is a water-only fill tower. The tower shall be located in the left front corner of the tank unless otherwise specified by the tank manufacturer to the purchaser. The tower shall have a 1/4" thick removable polypropylene screen and a PT3 polypropylene hinged cover. The capacity of the tank shall be engraved on the top of the fill tower lid. Inside the fill tower there shall be a combination vent/overflow pipe. The fill tower shall be shorter than the top of the body.

OVERFLOW AND VENT PIPE
The fill tower shall be fitted with an integral 6” ID schedule 40 P.V.C. combination overflow/vent pipe that is designed to run through the tank and shall be piped to discharge water behind the rear wheels, as required in NFPA 1900, so as to not interfere with rear tire traction.

TANK SUMP
There shall be one (1) sump, standard, per tank. The sump shall be constructed of a minimum of 1/2" PT3™ polypropylene and be located in the left/front quarter of the tank, unless specified otherwise. On all tanks that require a front suction, a 3" schedule 40 polypropylene pipe shall be installed that will incorporate a dip tube from the front of the tank to the sump location. The sump shall have a minimum 3" N.P.T. threaded outlet on the bottom for a drain plug, per NFPA. This shall be used as a combination clean-out and drain. All tanks shall have an anti-swirl plate located approximately 3" above the inside floor.

TANK OUTLETS
There will be two (2) standard tank outlets:

- One (1) for the tank-to-pump suction line, which shall be a minimum of 4” coupling and
- One (1) for a tank fill line, which shall be a minimum of a 2” N.P.T. coupling. Valving for the tank fill line shall be a minimum of 2”.

All tank fill couplings shall be backed with flow deflectors to break up the stream of water entering the tank.

WATER TANK MOUNTING
The tank shall rest on the body cross members, spaced a maximum of 22” apart, and shall be isolated from the cross members through the use of ¼” to 1/2” rubber, 2-1/2” wide. The tank shall sit, cradle-mounted, using four (4) stainless steel corner angles 3” x 3” x ¼” thick. Angles are welded directly to the body cross members. The angles shall keep the tank from shifting left to right or front to rear. The angles are also isolated from the tank through the use of ¼” to ½” rubber. The tank is designed on the free-floating suspension principle and shall not require the use of hold-downs. The tank shall be completely removable without disturbing or dismantling the apparatus body structure. The body or hose bed cross braces shall act as water tank retainers.

HI/LO TANK FOR LOWERED HOSEBED
The water tank shall be a Hi/Lo design with a full-height forward section and a lowered rear section to allow for the lowest possible hose bed.

The top of the upper/forward section of the tank will contain the tank fill tower(s) and will be finished as a dunnage area for mounting or storage of additional components and equipment. The floor of this dunnage area will be covered with fiberglass grating, model T-3500, 1" "T" bars with 35% open area - the same material as the hose bed. This will allow for proper drainage and ventilation.

BODY, COMPARTMENTS, AND TRIM
STAINLESS STEEL BODY & COMPARTMENT CONSTRUCTION
The complete apparatus body and subframe shall be fabricated of 12 gauge, type-304-grade stainless steel sheeting with a tensile strength of 87,000 psi and a yield strength of 39,000 psi.

All body and compartment components shall be break-form design. Compartments are constructed of 12 gauge, type 304 stainless steel. This shall include compartment floors, sidewalls, and ceilings. No Exception. Compartments shall be formed from a single sheet of metal when possible. The exterior of the compartments shall be solid-seam welded. The corner seams shall be caulked with gray silicone caulking. All burrs shall be removed to eliminate sharp edges.

Interiors of compartments are to be left natural stainless steel with a swirl finish applied to give a lasting and pleasing appearance.

COMPARTMENT SUPPORTS
Compartment floor supports shall be provided, fabricated of 12-gauge stainless steel. Support members measuring 2.00" x 4.00" shall be installed under the compartment floors. The supports shall be formed, U-shaped sections that will extend the full width beneath the compartment floors. The upper body walkway floor will be supported in a similar fashion.

STAINLESS STEEL SUBFRAME
A 1.50" x 3.00" stainless steel tubular subframe shall be fabricated to support the body and tank. Structural stainless steel rails shall run the full length of the body, across the top of the chassis frame rails. Stainless steel cross members measuring 3.00" shall be utilized to ensure rigidity, with cross members being spaced no more than 24" apart.

The subframe and cross members shall be MIG-welded. All compartments and all stainless steel sheeting shall be TIG-welded with 308 stainless steel filler wire.

The complete body structure shall be secured to the chassis frame rails with high-grade, 5/8" diameter U-bolts.

Heavy-duty rubber sill measuring 1.00" x 3.00"will be installed between the body subframe and chassis frame rails to prevent stress on the body and tank components. The rubber sill shall be retained by a full-length stainless steel channel.

STEPPING, STANDING, & WALKING SURFACES
All stepping, standing, and walking surfaces on the body shall meet NFPA 1900 anti-slip standards.

WHEEL WELLS
Twelve gauge stainless steel wheel wells shall be an integral part of the body construction.

Wheel wells and cabinetry are to be designed so road debris will not be trapped on top of the cabinets.

Full, one-piece, circular, 24"-deep stainless steel wheel well liners shall be installed. The fender flares shall be bright polished stainless steel and shall be attached to the wheel well using stainless steel bolts.

WHEEL WELL STORAGE
Wheel well storage shall be provided to equip a minimum of 6 Scott SCBA cylinders.

WIRING ACCESS PANELS
Wiring access panels shall be provided in the body interior corner compartments. The panels shall be bolted in place to allow easy removal for service.

FUEL TANK ACCESS
If the apparatus is equipped with a rear, frame-mounted fuel tank, a removable, bolt-on access panel will be provided in the rear compartment wall.

REMOVAL OF BODY
The completed body with all related parts will be removable in its entirety and shall accompany the water tank when removed.

FASTENERS
All fasteners used in securing components to the body shall be type 304 stainless steel.

COMPARTMENT VENTS
Compartments shall have a minimum of two (2) 4" louvered stainless steel vents per compartment. They shall be installed in the rear wall of each compartment in a fashion to prevent foreign matter and water from entering.

COMPARTMENT DRAINS
Duckbill-type rubber floor drains will be installed in the corners of the lower compartment floors.

PUMPER BODY - HINGED DOORS
LEFT SIDE COMPARTMENTS WITH RESCUE-STYLE HIGH SIDE

L1: 63.75.00” High x 28.00” Deep x 31.5” Wide
Door opens towards pump panel

L2: 31.75.00” High x 28.00” Deep x 64.00” Wide

L3: 63.75.00” High x 28.00” Deep x 48.00” Wide

REAR COMPARTMENT
RR: 30.75” High x 26.00” Deep x 36.00” Wide

RIGHT SIDE ¾ COMPARTMENTS WITH RESCUE-STYLE LOCKER

R1: 30.75” High x 13.00/28.00” Deep x 31.50” Wide

R2: 30.75” High x 13.00/28.00” Deep x 48.00” Wide

COMPARTMENT SHELVING AND STORAGE
LEFT SIDE COMPARTMENT

L1 - This compartment shall have one (1) pullout drawer, one (1) horizontally mounted shelf, and one (1) back wall mounting board.
L2 - This compartment shall have one (1) pull out tilt down shelf mounted horizontally halfway in the compartment.
L3 - This compartment shall have three (3) vertical pull out tool boards and one (1) vertically mounted partition for storage of a little giant ladder.

REAR COMPARTMENT

RR - This compartment shall have one (1) horizontally mounted adjustable shelf.

RIGHTSIDE COMPARTMENT

R1 - This compartment shall have one (1) pull out drawer.

R2 - This compartment shall have one (1) pull out drawer.

SQUARE BACK BODY DESIGN
The rear side body compartments and the body sidewalls shall extend all the way to the rear of the apparatus and shall be a squared-off design.

REAR BUMPER
The rear bumper shall be fabricated of 1.50" x 1.50" and 1.50" x 3.00" structural stainless steel tubing. The bumper shall be fully welded design and shall be welded to the rear side body compartments.

The rear bumper shall be 12.00" deep and shall run the full width of the vehicle with mitered corners.

BUMPER STEP SURFACE
The bumper step shall be covered with aluminum diamond plate, with welded end caps. The bumper stepping surface will comply with the latest version of NFPA 1900.

TOP SIDE BODY TRIM
The top of all side body compartments shall be covered with aluminum diamond plate.

Top overlay edges shall be angled downward and shall extended over the outer body panel approximately 1.00".

REAR BODY TRIM

Any areas on the rear not covered with reflective chevron stripping shall be covered with aluminum diamond plate.

FRONT COMPARTMENT TRIM
Front exterior wall of the front compartments shall be covered with aluminum diamond plate.

SIDE BODY POST TRIM
Side body support posts shall be covered with aluminum diamond plate.

PUMP HOUSE TRIM
The front of the pump house shall be covered with aluminum diamond plate.

STAINLESS STEEL RUB RAILS
Rub rails shall be provided and installed below each side compartment. The rub rail assembly shall be constructed of 1.00" wide x 1.50" high, heavy-duty, 14-gauge, 304-grade stainless steel tubing with black end caps and will be DA finished. Rub rails shall be bolted to the lower exterior edge of the apparatus body, with 0.50" nylon spacers installed between the body and the rub rail.

HOSE BED
A stainless steel hose bed with swirl finish shall be located above the water tank. The hose bed front and sidewalls shall be free of all sharp edges, to prevent hose damage. There shall be two (2) removable floor sections, constructed of fiberglass grating. This will allow for proper ventilation and drainage of hose.

HOSE BED DIVIDERS
Four (4) full-length, adjustable hose bed dividers shall be located in the hose bed and shall be fully adjustable by means of stainless steel uni-strut tracking. Tracking will be located at the front and rear of the hose bed.

Each divider shall be one piece and shall be constructed of 1/4" extruded aluminum. The divider's bottom T-bar shall extend the full length of the hose bed. A smooth 1/2" diameter top edge is provided to prevent damage to hose.

Each divider shall have a “V” notch cut in the middle for better access while repacking hose.

Two (2) dividers, one (1) on either side of the LDH shall be reinforced to help with bowing of the divider.

The dividers shall be bolted in place with stainless steel fasteners and shall be easily adjusted from side to side with simple hand tools.

HOSE BED CAPACITY
The hose bed shall be capable of holding the following hose (listed left-to-right):

300 Feet of 1.75" DJ hose single stacked (Pre-connected off the rear 2.5”discharge)
400 Feet of 1.75" DJ hose single stacked (Pre-connected off the rear 3”discharge)
1200 Feet of 5.00" LDH
300 Feet of 3.00" DJ hose (Dead lay)

300 Feet of 2.50" DJ hose single stacked (Pre-connected off the rear 3"discharge)

HOSEBED COVER
Two (2) stainless steel diamond plate lids shall be provided over the rear hose bed.

The lids shall have full-length stainless steel hinge. When the lids are in the closed position, they will overlap and create one (1) solid hose bed cover. When the lids are in the open position, they will allow full access to the hose bed.

HAND RAILS
Access handrails shall be constructed of 1-1/4" in diameter, extruded aluminum tubing with ribbed rubber inserts. Access rail escutcheons and brackets shall be chrome-plated and shall be attached with stainless steel bolts. Anchoring of posts and framing members for handrails of all types shall be capable of withstanding a load of at least 225 pounds, applied in any direction, at any point along the rail.

Hand rails and handholds shall be constructed so that three points of contact (two hands and one foot, or one hand and two feet) can be maintained at all times while ascending and descending.

VERTICAL HAND RAILS
Two (2) 12 volt 72" long blue LED handrails shall be mounted vertically, at the rear of the apparatus, one (1) on each side of the rear compartment.

HORIZONTAL HAND RAILS
One (1) 72" long handrail shall be mounted horizontally just below the hose bed.

FOLDING ACCESS STEPS
Twelve (12) Innovative Controls folding steps shall be provided and installed. Each step shall be designed to exceed the strength, load, and traction requirements of NFPA. Each step shall be chrome-plated and shall include a molded gasket to help prevent water ingress and keep the step mount from damaging painted surfaces. The step shall include a drain at the bottom to allow any water to escape the assembly.

The folding step shall be spring-loaded to hold the step in the upright, stowed position while in transit and when not in use.

The step shall include a white LED step light.

Location: Four (4) Rear of unit to allow easy access to the hose bed.
Four (4) Left side pump panel area
Four (4) Ride side pump panel area

ZICO QUIC-LIFT LADDER BRACKET
A Zico model LAS *Quic-Lift* vertical ladder bracket will be provided and installed on the right side of the unit, over the upper compartments.

Ladder mounting brackets will be designed to accommodate the Extension ladder with the bed section outward, positioned externally of the roof ladder, on aluminum brackets.

Two (2) hard suction lengths shall be mounted on Zico Quic-Lift above ladders.

Ladders shall automatically be lowered to a convenient height for safe and easy retrieval of the ladders.

The system is comprised of two (2) high-strength aluminum castings with Warner 12 volt linear actuators.

Control switch shall be mounted in the right side pump panel within view of the ladders.

Flashing warning lights are provided on each end of the bracket. An audible alarm shall also be provided. Lights and beeper are activated when ladder bracket is in motion. In addition, the warning system will be wired to the hazard warning light in the cab.

The outward ends of the rack that protrude beyond the body of the apparatus shall have reflective material to indicate a hazard or an obstruction.

FLOOR MATTING
All compartment floors shall be lined with black Mateflex 13" X 13" x 9/16" interlocking tiles with tapered edging at the front compartment opening.

COMPARTMENT DOORS
Doors to be fabricated of 304-grade stainless steel with 18 gauge inner and outer panels.

The doors shall be 3/4" thick and reduce the compartment depth by approximately 5/8" with the door closed. The double-panel design provides strength and a tight fit with 5/8" insulation installed between the panels for sound dampening.

Doors shall be of a rigid design. Door outer panel edges will be folded and welded to the inner panel. Welding of the inner panel directly to the outer panel face shall not be permitted due to distortion caused by welding. The use of body filler prior to painting of the outer door panels shall not be permitted. **No Exception**.

Each door is to have closed-cell rubber seal to provide a weatherproof seal between the door and compartment.

The compartment doors shall pivot on full-length stainless steel piano hinges with a 3/16" pin diameter. Hinges shall be welded to compartment wall and bolted to doors with 10-24 stainless steel bolts.

Compartment doors will have stainless steel flush bent D-ring handles. Latching mechanism shall be non-locking safety slam positive latch. Gasket material is placed between the door handles and outer door panels to prevent electrolytic reaction

between dissimilar metals to protect paint finish. Mechanism is enclosed in stainless steel not exposed to equipment stored in compartment.

An inner two-point latch shall be provided on the second door of all double doors with a rubber- covered pull cable, when applicable.

Interior of doors shall be left natural stainless steel with swirl finish applied to give a lasting and pleasing appearance.

DRIP RAILS
Painted J-channel shall be provided over each lower side body compartment, and at the front and rear of the compartments.

DOOR CLOSURES
All vertically hinged doors shall have power lift, gas-filled cylinders installed. Closure shall assist in the closing of door once it has past the halfway point.

DOOR CLOSURES
All horizontally hinged doors shall have power lift, gas-filled cylinders installed. Doors shall be held open at a 90-degree angle to the body. Closure shall assist in the closing of door once it has past the halfway point.

ELECTRICAL AND LIGHTING
ELECTRICAL MANAGEMENT SYSTEM
The apparatus shall be equipped with a multiplex 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 a scalable electrical harness utilizing Duetsche connectors. The nodes must be waterproof and not require special mounting requirements.

The system, at a minimum, shall be expandable, and 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

Real time data can be reported and displayed through several operator interface modules. The VFD is the display, user interface display. As an option, the EL “Vista” provides a built-in, audible alarm and menu-driven, input switches.

Placement of nodes throughout the apparatus enables a reduction in wire harness bundles, elimination of redundant harnesses and separate circuit boards, relays, 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-reprogrammable and reconfigurable 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, headlamp flasher, door open notification system, interlock modules, separate voltmeter, ammeter, and temperature monitor.

The Base System Shall Include:

- Total load management
- Load shedding capabilities
- Load sequencing capabilities
- Onboard diagnostics readout
- Very reliable, solid-state hardware
- Error reporting
- Display analog data (pressure, temperature…)
- 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 installed by the apparatus builder shall be furnished in the delivery manuals. These schematics will 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.

All wiring and electrical equipment shall meet NFPA 1900, (2024 edition,) and SAE standards.
A master optical warning device switch that energizes all of the optical warning devices shall be provided.

The optical warning system shall be capable of two separate signaling modes during emergency operations. One mode shall signal to drivers and pedestrians that the apparatus is responding to an emergency and is calling for the right of way. The other mode shall signal that the apparatus is stopped and is blocking the right of way. Switching of modes shall be controlled by the parking brake.

All wiring harnesses and associated wiring shall be secured with nylon ultraviolet-resistant cable ties or bolted to the body with cable clamps.

Polyolefin "heat-shrink" tubing with adhesive or Deutsch watertight connectors shall be used on all exterior-wiring connections.

Flexible, non-conductive polyurethane film shall be sprayed on all terminal studs, relays, starter, batteries, etc., to prevent corrosion.

JUNCTION BOX
The electrical junction box for all 12 volt wiring shall be located in a convenient location. It will be recessed into the compartment wall, so as not to protrude into the storage area. It shall be protected by a removable access panel. The compartment shall

be sealed and weather proof. All components in the compartment shall have identification tags.

CLEARANCE LIGHTS
All required clearance lights shall be provided at the rear and on each side of the unit to meet federal regulations. All lights will be LED-type with a five (5) year warranty.

On apparatus 30 feet in length or longer, an amber LED turn signal light with stainless steel flange shall be mounted, one (1) each side, in rear wheel well area at approximately running board height.

LED STEP AREA LIGHTING
Four (4) step area lights shall be provided, one (1) mounted each side on the front compartment face, to illuminate the panel running board steps, and two (2) mounted at the rear of the unit to illuminate the rear tailboard step. These lights shall be activated when the parking brake is applied. Whelen 3SCOCDCR series 3.00" round LED lights shall be utilized. Depending on body application, the lights will be either mounted in a rubber grommet or surface-mounted with a chrome flange.

HAZARD LIGHT
A red flashing light shall be located in the driving compartment, and shall be illuminated automatically whenever the apparatus parking brake is not fully engaged ***and:***

- Any passenger or equipment compartment door is open
- Any ladder or equipment rack is not in the stowed position
- A stabilizer system is deployed
- A powered light tower is extended
- Any other device is opened, extended, or deployed that creates a hazard or is likely to cause damage to the apparatus if the apparatus is moved.
- The light shall be marked "DO NOT MOVE APPARATUS WHEN LIGHT IS ON".

LICENSE PLATE LIGHT
One (1) Trucklite model 15055 LED license plate light and bracket shall be provided on the rear of the unit.

EMERGENCY WARNING LIGHT SWITCH CONTROLS
All warning light switches shall be mounted in the cab in a readily accessible location.

The master switch and individual switches furnished with custom chassis shall be utilized to allow the preselection of lights. The light switches are to be "rocker" type with an internal indicator light to show when the switch is energized. All switches are to be properly identified and mounted in a removable panel for ease of servicing. Identification of the switches shall be done by either printing or etching on the switch panel.

FIRETECH GAURDIAN JR. QUAD CLUSTER REAR DOT LIGHTING
Two (2) FireTech Guardian Junior Quad tail light assembly shall be provided with chrome bezels. Two (2) will have a BLUE Guardian Jr warning light

COMPARTMENT LIGHTS
SoundOff Signal model ECVCLLED43, 43” LED compartment lighting shall be provided in each compartment. The lighting shall be mounted behind the door track on both sides of the compartment.

All compartment lighting shall be automatic by the opening and closing of the door.

All main apparatus body compartments shall have door ajar switches.

LED GROUND LIGHTING
The apparatus shall be equipped with lighting capable of providing illumination at a minimum level of two (2) foot-candles on ground areas within 30.00" of the edge of the apparatus in areas designed for personnel to climb onto the apparatus or descend from the apparatus to the ground level. Lighting is designed to provide illumination on areas under the driver and crew riding area exits, which shall be activated automatically when the parking brake is set. Lights shall be installed in a manner that illuminates all walkways and steps for safe operation of the apparatus.

TecNiq E10-WSOO-1 6.00" LED lights mounted in a stainless steel bracket shall be utilized.

Two (2) lights mounted under the rear step.
One (1) light located on each side under the pump panel running boards.

PUMP COMPARTMENT LIGHT
One (1) SoundOff model ECVCSLLED10-10” LED pump compartment light shall be provided within the pump enclosure. The control switch shall be located on the pump operator’s panel.

HOSE BED LIGHTS
There shall be One (1) FireTech (model FT-CU-HD48) 48.00" Blue LED lights mounted centered at the front of the hose bed wall. The lights will be activated when the parking brake is applied.

DUNNAGE AREA LIGHTS
There shall be two (2) FireTech (model FT-CU-AQX-B) series 4.00” round blue LED lights provided and mounted in the dunnage area to provide adequate illumination of this area. The lights will be activated when the parking brake is applied.

NFPA APPROVED UPPER LEVEL LIGHT PACKAGE

ZONE A - FRONT UPPER
A cab roof light bar will be furnished with the custom chassis.

ZONE C - UPPER
Two (2) model L31HRFN Super Red LED 360 beacon lights mounted on the upper rear light stanchions.

WHELEN LOWER LEVEL LIGHTING

ZONE A - LOWER
Two (2) LED lights provided by chassis manufacture.

ZONE B & D- SIDE LOWER
One (1) LED lights provided by the chassis manufacture.

Two (2) M7 Super LED lights with chrome bezel mounted one (1) each side in the rear body fender area.

ZONE C - LOWER
Two (2) M6 Super LED lights mounted on the lower rear of the apparatus in M6FCV4 chrome housing.

LOWER LEVEL LIGHT LENS COLOR
The lower level lights shall have red lenses.

TECNIQ LED PARKING LIGHTS
Two (2) TecNiq model E61-WS00-1 LED surface lights shall be provided and mounted one each side in the rear fender area to provide side lighting toward the rear of the apparatus. Each light produces 1400 lumens. The lights shall be mounted in polished stainless steel housings. These lights shall be wired to activate with the backup lights.

ELECTRONIC SIREN
The electronic siren will be furnished with the custom chassis.

SIREN SPEAKER
The siren speaker will be furnished with the custom chassis.

LED SURFACE MOUNT SCENE LIGHT
Six (6) FireTech Guardian Elite surface mounted lights shall be mounted on the body of the apparatus. The location of these lights will be determined at pre-construction

Two (2) FireTech WL-X 20 LED Work Light shall be mounted on the upper rear of the body.

PAINT, LETTERING, AND GRAPHICS
PAINT AND PREPARATION
All metal surfaces will be properly sanded, prepared, and finished ready for our Axalta Coating Systems pretreatment. This is done to ensure optimum adhesion, corrosion resistance, and durability.

After pretreatment, 1220S Axalta Coating Systems 5000 URO primer filler is applied designed to fill any minor surface defects and provide an adhesion layer between the pretreatment and the Imron Base Coat/Clear Coat. This is also applied to improve color gloss, retention, and durability of the paint.

Next, the URO primer will be sanded to a smooth pre-painting surface. The surface will be decontaminated and prepared for application of High Solids Axalta Coating Systems Productive Base Coat/Clear Coat finish to complete the finished paint process.

A full inspection is performed of Defects, Depth Imagery, Gloss, Film Build, Color Match, and Texture, all to meet or exceed Axalta Coating Systems OEM fleet finish specifications.

Body assemblies that cannot be finish painted upon assembly shall be painted prior to finish assembly. All doors are removed and painted separate from the body.

Prior to reassembly and reinstallation of lights, handrails, door hardware, and any miscellaneous items, a gasket material or silicone sealant shall be applied to prevent damage to the finish painted surfaces and to protect against electrolysis between dissimilar metals.

Touch up paint shall be provided for each color paint used.

The complete apparatus body will be painted a single color to match the color of the cab. The cab shall remain as painted from the chassis supplier.
Paint Color _____ - Paint #_____

GOLD LEAF WARRANTY
The gold leaf shall come with a 1-year warranty against fading or deterioration.

LETTERING
Lettering shall be provided. It shall be computer generated, non-reflective, SignGold vinyl 23.5 Kt gold lettering with a black border.

Computer generated lettering provides a proportional layout design and durable finish.

Included will be a maximum of seventy five (75) three (3) inch letters.

Pinstriping - Body Sides

Twenty-Three and one half Karat (23.5KT) gold leaf adhesive backed striping, outlined in black, shall be installed on the driver and officer's sides of the body. Each side striping shall be applied to the outer surface of the compartment doors only, framing the body side.

Corner scrolls shall be applied in all four corners and arrow ends applied ahead and behind the rear wheel wells.

REFLECTIVE STRIPING

A 4" wide body color gray reflective stripe shall be applied to the unit in a straight line centered between two (2) 1/2” wide body color gray reflective stripes.

Per NFPA 1900, 2024 edition, section 12.8.3.1 this shall include at least 50 percent of the cab and body length on each side, excluding the pump panel areas, and at least 25 percent of the width of the front of the apparatus.

REFLECTIVE CHEVRON - NFPA 1900, 2024 edition, section 12.8.3.2
50 percent of the rear-facing vertical surfaces, visible from the rear of the apparatus shall be equipped with retroreflective striping in a chevron pattern sloping downward

and away from the centerline of the vehicle at an angle of 45 degrees. Each stripe shall be 6" in width.

Diamond Grade Stripe Colors will be Scotchlite™ Red #680-72 and Scotchlite™ Yellow #680-71.

EQUIPMENT
An $8,000 contingency line item is included in this specification, to be used for equipment mounting or other unforeseen expenses. Any unused portion shall be returned to the customer at final inspection as a deduction from the final payment or in kind.

The following equipment shall be provided along with any necessary mounting brackets.

NFPA EQUIPMENT CLARIFICATION

Any equipment specified in the “Minor Equipment” section (e.g. hose, nozzles, adapters, AED, traffic cones, traffic safety vests, etc.) of NFPA 1900 for each apparatus classification, which is not specified in this proposal, will be considered to be customer supplied.

10' FOLDING LADDER

One (1) Duo-Safety Series 585-A, 10' folding ladder shall be provided. The ladder shall consist of 1-section aluminum ladder with rubber feet and shall meet or exceed the latest NFPA standards.

14' ROOF LADDER

One (1) Duo-Safety, 14’ Roof, Double End 775DR, 14' roof ladder shall be provided. The ladder shall consist of a single section aluminum ladder with folding steel hooks and steel spikes on both ends. Ladder shall meet or exceed the latest NFPA standards.

24' EXTENSION LADDER

One (1) Duo-Safety, model 900-A, 24' aluminum two-section extension ladder. The ladder shall consist of two (2) aluminum sections. Ladder shall meet or exceed the latest NFPA standards.

6' **FIRE HOOKS UNLIMITED NY ROOF HOOK**
Two (2) 6’ Fire Hooks Unlimited NY Roof hooks with pry ends shall be provided and mounted in customer specified location.

10 LB ABC EXTINGUISHER
One (1) Amerex model FE-419-10 w/#812 Bracket, 10LB ABC Stored Pressure Dry Chemical Extinguisher shall be provided and mounted in customer specified location.

CO2 EXTINGUISHER
One (1) Amerex model FE-331 w/#811 bracket, 15lb CO2 Fire Extinguisher shall be provided and mounted in customer specified location.

2-1/2 GALLON PRESSURE WATER EXTINGUISHER
One (1) Amerex model FE-240 w/810 bracket, 2-1/2 gallon pressure water extinguisher shall be provided and mounted in customer specified location.

WHEEL CHOCKS
Two (2) Zico AC32 wheel chocks will be provided and mounted under the left front compartment.

SPANNER WRENCH SET W/HYDRANT WRENCH
Three (3) set of Kochek style K45-3-KBR spanner wrenches shall be provided and mounted in customer-specified location. Includes (1) hydrant wrench and (2) spanner wrenches with mounting bracket.

Location: Left and right pump panels and rear of body

SPANNER WRENCH SET
Three (3) set of Kochek style K46-2-KBR spanner wrenches shall be provided and mounted in customer specified location. Includes (2) spanner wrenches with mounting bracket.

Location: Left and right pump panels and rear of body

SAFETY FIRE VEST

The NFPA required Safety Vest will be supplied and installed by the purchaser before the truck is placed into service.

TRAFFIC CONES
The NFPA required traffic cones will be supplied and installed by the purchaser before the truck is place into service.

AUTOMATIC EXTERNAL DEFIBRILLATOR (AED)
The NFPA required AED will be supplied and installed by the purchaser before the truck is placed into service.

Dewalt Battery Powered Equipment
One (1) DCCS670X1 60V MAX* 16 IN. Brushless cordless chainsaw kit shall be provided. This kit shall include one (1) FLEXVOLT 20V/60V MAX* battery that powers 60V MAX* tools or it can be backwards compatible to work with 20V MAX* tools.

One (1) DCS692 60V MAX* Brushless Cordless 9 IN. Cut-off Saw shall be provided.

Three (3) FLEXVOLT 20V/60V MAX* batteries that powers 60V MAX* tools or it can be backwards compatible to work with 20V MAX* tools shall be provided.

One (1) DCB104 12V MAX*/20V MAX*/ FLEXVOLT® 8 AMP fan cooled multiport fast charger shall be provided. **Location TBD**.

MOUNTING LOCATIONS TO BE DETERMINED AT FINAL INSPECTION

1. Irons set (2)
2. Rescue (Rotary) Saws (1)
3. Chain saws (1)
4. Shovels (2)
5. Axes
6. Bolt cutters
7. Pry Bars
8. Hooks
9. Sledgehammers
10. SuperVac Fan
11. Portable Scene Light
12. Thermal Imaging Camera
13. 4Gas meter
14. Portable Radios and chargers (6)
15. Map box
16. Additional Handrails

Providing drawings, the manufacturer may propose locations to Southbury Vol. Firemen's Assoc. in advance for approval if obvious positioning exists. Southbury Vol. Firemen's Assoc. will approve each in writing.