MUSKEGON HEIGHTS FIRE DEPARTMENT

Muskegon Heights, MI

Custom Pumper

REQUEST FOR PROPOSAL

	Bidder Complies	
	Yes	No

NOTICE OF REQUEST FOR PROPOSAL

The City of Muskegon Heights hereby gives Public Notice of the request for proposal for the purchase of one (1) Fire Pumper (Fire Engine) apparatus and auxiliary equipment per the specifications described on the attached pages.

Sealed proposals are to be received by 2:00PM on the 22nd day of June 2022_.

QUESTIONS ABOUT AND CLARIFICATIONS OF THE REQUEST FOR PROPOSAL

All questions regarding this Request for Proposal (RFP) shall be submitted via email.. All questions shall be submitted on or before Tuesday, June 13, 2022, at 3:00 PM and shall be emailed to ChiefChristopher Dean chris.dean@mcd911.net.

Schedule

RFP Issued and Advertised	June 04, 2022
Pre-Bid Meeting	June 9, 2022 via Zoom
Deadline for Proposals	June 22, 2022 2:00PM EST
Bid Opening	June 22, 2022 2:00PM EST (Immediatelyfollowing deadline)
Bid Review	TBA
Bids to Finance Committee	TBA
Bids to City Council	TBA
Tentative Contract Award Date	July 25, 2022
Tentative Delivery Deadline	TBA

Zoom Information

Pre-Bid Meeting MHFD RFP 2022-0002

Topic: Pre Bid Meeting RFP 2022- 0002 Fire Pumper
Time: Jun 9, 2022 01:00 PM America/Detroit

Join Zoom Meeting
https://us02web.zoom.us/j/82937200342?pwd=ZGk4U2xRR29tck5qSVdaZHJJenBPdz09

Meeting ID: 829 3720 0342
Passcode: 799753
One tap mobile
+19292056099,,82937200342#,,,,*799753# US (New York)
+13017158592,,82937200342#,,,,*799753# US (Washington DC)

Dial by your location
+1 929 205 6099 US (New York)
+1 301 715 8592 US (Washington DC)
+1 312 626 6799 US (Chicago)

	Bidder Complies	
	Yes	No

+1 669 900 6833 US (San Jose)
+1 253 215 8782 US (Tacoma)
+1 346 248 7799 US (Houston)
Meeting ID: 829 3720 0342
Passcode: 799753
Find your local number: https://us02web.zoom.us/u/kfYyH9Ae6

INTENT OF SPECIFICATIONS

It is the intent of these specifications to cover the furnishings and delivery to the Muskegon Heights Fire Department complete and soundly engineered fire apparatus equipped as hereinafter specified. These specifications address only general requirements regarding the type of construction and tests to which the apparatus must conform. Also, only general requirements of certain details concerning finish, equipment, and appliances with which the successful bidder must comply are included in these specifications. Where not otherwise specified, minor details of construction and materials are left to the discretion of the contractor, who shall be solely responsible for the design and construction of all features. The apparatus shall conform to the requirements of the current National Fire Protection Association Standard 1901 for Pumper Fire Apparatus, as if they were written out in full detail, insofar as they apply, unless otherwise indicated in these specifications.

SUBMISSION AND RECEIPT OF PROPOSAL

Proposals to receive consideration shall be received prior to the specified time of opening as designated on the bid form. NO LATE PROPOSALS WILL BE ACCEPTED.

The City of Muskegon Heights reserves the right to postpone the opening for its own convenience. Bidders shall use the proposal documents furnished as none other may be accepted. Proposals are considered received when in the possession of the Muskegon Heights City Clerk. All proposals shall be labeled with the RFP number, item, as well as the aforementioned deadline date/time and the vendor name and address on the outside of the envelope. Proposals shall be sealed when submitted. Separate proposals shall be submitted on each proposal number and shall be typewritten or written in ink and legibly prepared. Proposals having any erasures or corrections thereon may be rejected unless explained or initialed by the bidder. If you are submitting a “No Bid,” do not follow the above directions but send a letter to the City Clerk’s Office indicating a “No Bid.” Proposals shall be mailed or delivered to the City of Muskegon Heights , Clerk’s Office, 27600 Jefferson Circle Drive, Muskegon Heights , MI 48081 before the stated deadline.

RESPONSIVE PROPOSALS

	Bidder Complies	
	Yes	No

All pages and the information requested herein shall be furnished completely in compliance with instructions. The manner and format of submission is essential to permit prompt evaluation of all proposals on a fair and uniform basis. Unless otherwise specified, the City of Muskegon Heights reserves the right to accept any item in the proposal. Bidders may submit proposals on any item or group of items, provided however, that the unit prices are shown as required. According, the City of Muskegon Heights reserves the right to declare as non-responsive, and reject any incomplete proposal if material information requested is not furnished, or where indirect or incomplete answers or information is provided. Alterations to the written requirements will negate any response. The City of Muskegon Heights promotes "green" technologies and the reduction of waste. When possible, your response should be double-sided to reduce paper usage. Other factors including source of supply may be used in award recommendations.

The City of Muskegon Heights shall accept NO CHANGES to the proposal document made by the vendor unless those changes are set out in the "Exceptions" provision of the Authorized Version of the proposal document. It is Vendor's responsibility to acquire knowledge of any change, modifications or additions to the Authorized Version of the proposal document. Any Vendor who submits a proposal and later claims it had no knowledge of any change, modifications or additions made by the City of Muskegon Heights to the Authorized Version of the proposal document, shall be bound by the proposal, including any changes, modifications or additions to the Authorized Version. If a proposal is awarded to a Vendor who claims it had no knowledge of changes, modifications or additions made by the City of Clair Shores to the Authorized Version of the proposal, and that Vendor fails to accept the award, the City of Muskegon Heights may pursue costs and expenses to re-bid the item from that Vendor. The Authorized Version of the bid document shall be that document appearing on the MITN with amendments and updates.

INTERPRETATION OF PROPOSAL AND/OR CONRACT DOCUMENTS

Any interpretation to a bidder regarding the Proposal and/or Contract Documents or any part thereof, is valid only if given by the City of Muskegon Heights Fire Dept. staff. Any information given by departmental contacts is unofficial. Interpretations may or may not be given orally (may be written) dependent upon the nature of the inquiry. Interpretations that could affect other bidders will be in writing and issued by the Fire Department. All inquiries shall be made within reasonable time prior to the stated deadline in order that a written response in the form of an addendum, if required, can be processed before bids are opened. Inquiries received that are not made in a timely fashion may or may not be considered.

CHANGES AND ADDENDA TO PROPOSAL DOCUMENTS

Each change or addendum issued in relation to this proposal will be placed on MITN. It shall be the bidder's responsibility to make inquiry as to the changes or addenda issued. All such changes or addenda shall become part of the contract and all bidders shall be bound by such changes or addenda

SPECIFICATIONS

	Bidder Complies	
	Yes	No

Unless otherwise stated by bidder, the proposal will be considered as being in strict accordance with the City's applicable standard specifications, and any special specifications outlines in the document. Reference to a particular trade name, manufacturer's catalog or model number are made for descriptive purposes to guide the bidder in interpreting the requirements of the City, and should not be construed as excluding bids on other types of materials, equipment and supplies unless otherwise stated. However, the bidder, if awarded the contract, will be required to furnish the particular item referred to in the specifications or description unless departure or substitution is clearly noted and described in the proposal. The City reserves the right to

determine if equipment/product or service being bid is equal to the specified equipment/product or service requested.

ALTERNATES

Bidders are cautioned that any alternate proposal, unless requested by the Fire Dept. or any changes, insertions, or omissions to the terms and conditions, specifications, or any other requirements of this proposal, may be considered non-responsive, and at the opinion of the City, may result in rejection of the proposal.

TAXES, TERMS AND CONDITONS

The City of Muskegon Heights is exempt from Federal Excise and State Sales Tax. The city's tax exemption number is 38-6004730. General payment terms are 30 days upon receipt of goods (unless otherwise stated below).

AWARD

The bid will be awarded to that responsible, responsive bidder whose proposal, conforming to this solicitation, will be most advantageous to the City, price and factors considered. The City reserves the right to accept or reject any or all proposal, in part or whole and to waive informalities and minor irregularities in bids received. Unless otherwise specified in the document, the City reserves the right to accept any item in the proposal on an individual basis. Bidders may submit proposals on any item or group of items provided unit prices are clearly shown and a notation is made on the document clearly indicating Bidder's intent.

WITHDRAWL OF PROPOSAL

Proposals may be withdrawn in person by a bidder, or authorized representative, provided their identity is made known and a receipt is signed for the proposal, but only if the withdrawal is made prior to the stated proposal deadline. No proposal may be withdrawn for at least 30 days after the proposal opening except the successful company whose prices shall remain firm for the entire contract period. In case of error by the bidder in making up a proposal, the Fire Dept. staff may, by discretion, reject such a proposal upon presentation of a letter by the Bidder which sets forth the error, the cause thereof, and sufficient evident to substantiate the claim.

DEFAULT CONDITIONS

	Bidder Complies	
	Yes	No

In case of default by the contractor, the City of Muskegon Heights may procure the articles or services from other sources and hold the bidder responsible for any excess cost occasioned thereby. In case of error by the bidder relating to a contract, the Fire Dept. staff may, by discretion, upon presentation of a written explanation by the bidder substantiating the error, reject the contract and award to the next qualified bidder; such error may be subject to default conditions.

INFRINGEMENTS AND INDEMNIFICATIONS

The bidder, if awarded a contract, agrees to protect, defend and save the City, its officials, employees, departments and agents harmless against, any demand for payment for the use of any patented material, process, or device that may enter into the manufacture, construction, or from a part of the work covered by either order or contract; and from suits of a charge of every nature and description brought against it for, or on account of, any injuries or damages received or sustained by the parties by or from any of the facts of the contractor, the contractor's employees, or agents, from all liability claims, demands, judgments and expenses to persons or property occasioned, wholly, or in part, by the acts or omissions of the bidder, contractor, agents or employee.

PATENTS, COPYRIGHTS, ETC.

The Contractor shall release, indemnify and hold the Buyer, its officers, agents and employees harmless from liability of any kind or nature, including the Contractor's use of any copyrighted or un-copyrighted composition, secret process, patented or unpatented invention, article, or appliance furnished or used in the performance of this contract.

NON-COLLUSION

By signing the proposal, the bidder certifies that the proposal submitted has been arrived at independently and has been submitted without collusion with, and without any agreement, understanding or planned common course of action with any other vendor of materials, supplies, equipment or services described in the Request for Proposal, designed to limit independent bidding or competition.

CANCELLATION

Unless otherwise stated in the additional terms and conditions listed in the RFP, any contract entered into as a result of this bid may be cancelled without cause by either party upon 30 days' notice, in writing, prior to the effective date of the cancellation. Cancellation may be in whole or in part. Any cancellation under this provision shall not affect the rights and obligations attending orders outstanding at the time of cancellation, including any right of any purchasing entity to indemnification by the contractor, rights of payment for goods/services delivered and accepted, and rights attending any warranty or default in performance in association with any order. Cancellation of the contract due to contractor default may be immediate.

DEFAULT AND REMEDIES

	Bidder Complies	
	Yes	No

Any of the following events shall constitute cause for the City of Muskegon Heights to declare Contractor in default of the contract: A. Nonperformance of contractual requirements, or B. A material breach of any term or condition of this contract. Please note: the City of Muskegon Heights shall issue a written notice of default providing a period in which Contractor will have an opportunity to remedy. Time allowed for remedy shall not diminish or eliminate Contractor's liability for liquidated or other damages. If the default remains after Contractor has been provided the opportunity to remedy, the City of Muskegon Heights may do one or more of the following: A. Exercise any remedy provided by law; B. Terminate this contract and any related contracts or portions thereof; C. Impose liquidated damages, or D. Suspend contractor from further proposal solicitations.

LAWS AND REGULATIONS

All supplies, services and equipment offered and furnished shall comply fully with all applicable Federal and State laws and regulations.

GOVERNING LAW

This procurement and the resulting agreement shall be governed by and construed in accordance with the laws of the State of Michigan. The construction and effect of any Participating Addendum or order against the contract(s) shall be governed by and construed in accordance with the laws of the participating entity's State. Venue for any claim, dispute or action concerning an order placed against the contract(s) or the effect of a Participating Addendum shall be in the participating entity's state.

ASSIGNMENTS/SUBCONTRACT

Contractor shall not assign, sell, transfer, subcontract or sublet rights or delegate responsibilities under this contract, in whole or in part, without the prior written approval of the City of Muskegon Heights .

NON-DISCRIMINATION

The bidder agrees to abide by the provisions of Title VII of the Civil Rights Act of 1964 (42 USC 2000e) which prohibits discrimination against any employee or applicant for employment, or any applicant or recipient of services, on the basis of race, religion, color, or national origin; and further agrees to abide by Executive Order No. 11246, as amended, which prohibits discrimination on the basis of sex; 45 CFR 90 which prohibits discrimination on the basis of age, and Section 504 of the Rehabilitation Act of 1973, or the Americans with Disabilities Act of 1990, which prohibits discrimination on the basis of disabilities. The bidder further agrees to furnish information and reports to requesting agencies, upon request, for the purpose of determining compliance with these statutes. The bidder agrees to comply with the City of Muskegon Heights ' certification requirements, if any, as stated in the additional terms and conditions listed in the solicitation. This contract may be cancelled if the bidder fails to comply with the provisions of these laws and regulations. The bidder must include this provision in every subcontract relating to purchases by the agencies to insure that subcontractors and vendors are bound by this provision.

	Bidder Complies	
	Yes	No

SEVERABILITY

If any provision of this contract is declared by a court to be illegal or in conflict with any law, the validity of the remaining terms and provisions shall not be affected; and the rights and obligations of the parties shall be construed and enforced as if the contract did not contain the particular provision held to be invalid.

FORCE MAJEURE

Neither party to this contact shall be held responsible for delay or default caused by fire, riot, Acts of God and/or war which is beyond that party's reasonable control. The City of Muskegon Heights may terminate this contract after determining such delay or default will reasonably prevent successful performance of the contract.

PROPOSAL PREPARATION COSTS

The City of Muskegon Heights is not liable for any costs incurred by the bidder in proposal preparation.

CONFLICT OF INTEREST

The contractor certifies that it has not offered or given any gift or compensation prohibited by the state laws of any agency participant or to any employee of the participating agencies to secure favorable treatment with respect to being awarded this contract.

INDEPENDENT CONTRACTOR

The contractor shall be an independent contractor, and as such shall have no authorization, express or implied to bind the City of Muskegon Heights to any agreements, settlements, liability or understanding whatsoever, and agrees not to perform any acts as agent for the City of Muskegon Heights except as expressly set forth herein.

NON-IRAN LINKED BUSINESSES

By signing below, I certify and agree on behalf of myself and the company submitting this proposal the following: (1) that I am duly authorized to legally bind the company submitting this proposal; and (2) that the company submitting this proposal is not a "Iran-linked business," as that term is defined in Section 2€ of the Iran Economic Sanctions Act, being Michigan Public Act No. 517 of 2012; and (3) that I and the company submitting this proposal will immediately comply with any further certifications or information submissions requested by the city in this regard.

INSURANCE (REQUIRED FOR WORK ON OR WITHIN CITY PROPERTY/FACILITIES)

The contractor, and any and all of their subcontractors, shall not commence work for the City of Muskegon Heights until they have obtained the insurance required under this paragraph. All coverage shall be with the insurance carriers acceptable to the City of Muskegon Heights . The city reserves the right to verify insurance carrier standing.

	Bidder Complies	
	Yes	No

A. Workers' Compensation Insurance: The contractor shall procure and maintain during the life of this contract, Workers' Compensation Insurance, including Employers' Liability Coverage with limits of no less than $500,000.

B. General Liability: The contractor shall procure and maintain during the life of this contract, Commercial General Liability Insurance on an "Occurrence Basis" with limits no less than $1,000,000.00 per occurrence and aggregate project. Coverage shall include the following extensions (A) Contractual Liability; (B) Products and Completed Operations; (C) Independent Contractor Coverage; (D) Broad Form General Liability Extensions or equivalent, and, if not already included: Deletion of all Explosion, Collapse and Underground (XCU) Exclusions (if applicable).

C. Motor Vehicle Liability: The contractor shall procure and maintain during the life of the contract Motor Vehicle Liability Insurance, including Michigan's No-Fault Coverage, with limits of liability not less than

$1,000,000.00 per occurrence combined single limit for Bodily Injury and Property Damage. Coverage shall include all owned vehicles, all non-owned vehicles and all hired vehicles.

D. Additional Insured: All insurance as described above shall include an endorsement stating the following shall be ADDITIONAL INSUREDS: The City of Muskegon Heights , all elected and appointed officials, all employees and volunteers, all boards & commissions and/or authorities and board members including employees and volunteers thereof. It is understood and agreed by naming The City of Muskegon Heights as additional insured, coverage afforded is considered primary and any other insurance the city may have in effect shall be considered secondary and/or excess.

E. Cancellation Notice: All Insurance listed above shall be endorsed "Thirty days advanced written notice of cancellation/reduction material change will be provided."

F. Proof of Insurance Coverage: An ACORD form outlining insurance coverage is required prior to commencement of work. All documents will be forwarded to the City of Muskegon Heights Fire Dept. Muskegon Heights, MI 49444

<u>EXAMINATION OF SPECIFICATIONS</u>

It is incumbent on each manufacturer to be thoroughly familiar with the specification contained herein. The specification will require a "YES" or "NO" or when requested a definitive answer to each section or subsection. Sections or subsections not marked with a "YES" or "NO" or answered shall be deemed incomplete and considered non-responsive. A "YES" answer constitutes a complete compliance to the section or subsection as written. A "NO" shall indicate noncompliance and does not eliminate a manufacturer from competition. A manufacturer may object or counter to a specific section or subsection. A manufacturer must indicate in writing, as an attachment, the section or subsection in dispute. The manufacturer must include the verbiage as written, new verbiage presented, explanation of

	Bidder Complies	
	Yes	No

verbiage with consequences and supporting tests and documentation. Failure to comply will be deemed as non-responsive. This agency reserves the right to determine compliance.

DEFINITIONS:

The following definitions shall apply with regards to these specifications.

- PURCHASER: The end user of the equipment specified or the applicable purchasing agency acting on behalf of the end user.
- CONTRACTOR: The individual, firm, partnership manufacturer, or corporation to whom the contract is awarded by the Purchaser and is subject to the terms thereof. For bidding purposes the contractor, vendor, bidder, manufacturer are synonymous.
- EQUAL: This agency supports the design, engineering, quality and materials as specified in this document. This shall not prohibit the bidding of unlike product. However, any deviation from the specification must be marked. Failure to do so may be deemed non-responsive.
- MANUFACTURER: The manufacturer within this specification shall be considered the "primary manufacturer." The chassis requirement as set forth in this specification is the responsibility of the primary manufacturer to procure. It is imperative that the primary manufacturers procure the exact chassis from the chassis manufacturer. This agency will require documentation from the chassis manufacturer pertaining to the chassis requirements for this agency. Failure to provide documentation after award and prior to construction may result in the termination of the contract.

  BIDDERS RESPONSIBILITY AND QUALIFICATION.

  It is not the intent of these specifications to call for an unusual or experimental vehicle(s). The primary manufacturer shall have a minimum of 10 years of uninterrupted manufacturing of similar or identical vehicles to the specifications set forth in this bid.

  If requested by the purchaser, the primary manufacturer shall supply upon request a list of five (5) agencies that have purchased similar or identical vehicles within the past year from date of bid. The list will have contact names and phone numbers. For the purpose of this section, if the bidder of record and the primary manufacturer are separate business entities, then each shall be required to submit financial, insurance, and/or licensor to conduct business within this jurisdiction. Failure to provide proper documentation with the bid response may result in any bid being deemed non-responsive.

The primary manufacturer shall be ISO 9001:2000 certified. No Exceptions.

The primary manufacturer shall employ full time a Quality Control Manager whose primary function is to monitor quality. No Exceptions.

	Bidder Complies	
	Yes	No

PAYMENT, DELIVERY AND ACCEPTANCE -A deposit may be remitted with the order not to exceed ten percent (10%) of the total contract amount. This agency reserves the right to issue a binding municipal Purchase Order in lieu of a deposit. The choice to submit either the deposit and/or the binding purchase order will be that of this agency.

Prepayments or progress payments for any part or material after contract award shall be negotiated prior to the signing of the construction contract.. It is the intent of this agency to do business with a company of sufficient financial means to meet the financial burdens necessary complete and delivery the vehicle as specified.

If a prepay discount is utilized then the above language does not apply.

If a prepay discount is utilized then a performance bond shall be required.

Unless otherwise requested, the primary manufacturer shall arrange over the road delivery of the completed vehicle to this agency's designated local address under the vehicles own power. Costs of transportation and preparation are to be included with the price as bid. The primary manufacturer, may as an option, offer a line-item credit for pick up by this agency at their place of manufacture.

All bid prices and conditions must be specified on the Bid Proposal Form.

Bid prices shall be valid for Sixty (60) days. In the unforeseen circumstance that this agency requires the primary manufacturer to extend pricing requirement; then it will be at the discretion of this agency to request in writing from the primary manufacturer any deviation in prices quoted. The primary manufacturer may revise pricing and state in writing reasons for any change and certify the amended pricing for one hundred twenty (120) additional days.

BID EVALUATION

Bids received shall be evaluated by the Purchaser. This evaluation will be based on the following:

- – Completeness of the proposal
- – Manufacturing and Delivery schedule
- – Primary manufacturer's demonstrated capabilities and qualifications
- – Primary manufacturer's past performance on similar Bid Proposals
- – Primary manufacturer's maintainability and recommendations
- – Primary manufacturer's logistical and service support

Bid proposals taking total exception to these specifications will not be accepted.

PRE-CONSTRUCTION CONFERENCE - The successful primary manufacturer shall be required to hold a pre-construction conference with representatives of this agency to finalize construction details. In the event it is deemed necessary by both parties that the conference be

	Bidder Complies	
	Yes	No

held at a location other than at this agency; the following shall occur. The primary manufacturer will provide adequate transportation, lodging, and meals for two (2) designated personnel from this agency. Further, if the location is in an excess of two hundred fifty (250) miles from this agencies location, the transportation shall be by a commercial carrier. If the location is in an excess of four hundred fifty (450) miles from this agencies location, the transportation shall be by a commercial air carrier.

FINAL INSPECTION

A final inspection shall occur at the primary manufacture location, in a temperature-controlled inspection area separate from the production facility. The primary manufacturer will provide adequate transportation, lodging, and meals for two (2) designated personnel from this agency. Further, if the location is in an excess of two hundred (200) miles from this agency's location, the transportation shall be by a commercial air carrier. Private or corporate aircraft may not be used.

DRAWINGS

The primary manufacturer shall provide a set of drawings that accurately depict the vehicle as specified. The drawings will show all exterior and interior planes with dimensions. Failure to comply will be deemed non- responsive.

ANTI-COLLUSION STATEMENT

By signing this bid, the primary manufacturer agrees that this bid is made without any understanding, agreement or connection with any other person, firm or corporation making a bid for the same purpose and this bid is in all respects fair and without collusion or fraud.

CONDITIONS FOR SOLICITATION OF PROPOSALS

1. Price quotations shall be firm FOB Muskegon Heights, MI and exclusive of any Federal excise tax and all State of Michigan tax.

2. Each proposal shall be accompanied by a set of contractor's specifications consisting of a detailed description of the apparatus and equipment proposed, including warranties and guarantees, a ½" – 1' scale drawing of the exact apparatus, and specifications indicating size, type, model, and make of all component parts and equipment.

Manufacturer's specifications shall be submitted in the same order as the published specifications, in order to facilitate effective proposal review by the fire department.

Each proposal shall include a "Statement of Exceptions" as indicated in NFPA 1901 Section 4.21. The statement of exceptions shall specifically describe each aspect of the completed apparatus that will not be fully compliant with the requirements of the standard at the time of delivery.

The drawing and specifications must be approved by the department prior to construction.

	Bidder Complies	
	Yes	No

The written specifications shall take precedence over the drawing where discrepancies may arise. Any proposal received without these specifications and drawing shall be automatically rejected. There shall be No Exceptions to any of these requirements.

3. A bid bond in the amount of 10% shall be provided with the proposal.

4. Proposals will only be considered from companies which have established a favorable reputation in the field of fire apparatus construction. Therefore, each bidder shall furnish the following information:

a. A customer listing of like units in service and their location.
b. The location of the closest factory representative in proximity to department.
c. The manufacturer's closest factory staffed facility to Customer.
d. Documentation of the length of time manufacturing aluminum fire apparatus bodies.

5. Each proposal shall furnish satisfactory evidence of the ability to construct the apparatus as specified and show proof that the manufacturer is in a position to render prompt service and furnish replacement parts for said apparatus.

6. The proposal shall specify the location(s) of warranty work. If the warranty work is to be performed at a location other than the manufacturer, a statement must be made naming the party or parties responsible for delivery and pick-up of the apparatus to the location. Expenses that are covered by the manufacturer should be included along with a listing of acceptable firms for performing warranty work. A statement indicating whether warranty work performed by a vehicle maintenance shop would be compensated by the manufacturer shall also be included.

7. Total delivery time from contract award and receipt of order to the department must not exceed 425 calendar days from the formal acceptance of this request for proposals. Proposals exceeding this schedule will be rejected. The successful manufacturer shall acknowledge the receipt of the order and certify the delivery schedule within 14 calendar days of contract signing.

8. The successful manufacturer must submit a full set of accurate drawings and specifications to the department for approval before the apparatus goes on the production line.

9. Failure to comply with any of the above items may be cause for immediate rejection of the proposal.

SERVICE

The bidder must have "Factory Direct Service". The manufacturer must stock all replacement parts for said apparatus. The bidder must include all information about the "Factory Direct Service Center", including the distance from the service center to Muskegon Heights, MI. If

	Bidder Complies	
	Yes	No

the bidder does not have a "Factory Direct Service Center", all information about the factory authorized service center shall be included. The information shall include but not be limited to the following:

Number of miles from the service center to Muskegon Heights
Number of EVT (Emergency Vehicle Technician) certified mechanics
Description of all repair work (major or minor) that can be performed
Description of all repair work that would have to be sent back to factory for repair.
Description of all chassis and chassis related work that can be performed at the service facility including warranty work

If any repair or warranty work shall be contracted to a facility not owned by the bidding dealership, the address of the contracted facility must be noted.

ISO 9001

The manufacturer shall operate a Quality Management System under the requirements of ISO 9001. These standards, sponsored by the "International Organization for Standardization (ISO)," specify the quality systems that shall be established by the manufacturer for design, manufacture, installation and service.

INSTRUCTION OF MANUFACTURERS

1. Proposals must be typewritten, legible, and in their original form. No copies will be accepted.

2. When requested, samples or descriptive matter shall be filed prior to the opening of the proposals.

3. In submitting the proposal, the manufacturer agrees that acceptance of the proposal by the department within the stated period of proposal validity, constitutes a contract. No delivery shall become due or be accepted unless notification in writing is first made.

4. The specifications identified by an asterisk (*) shall be individually priced, as they may be deleted by the purchaser in the final contract.

5. The successful manufacturer shall indemnify and save harmless the department, its officials, agents, and employees, against all claims for royalties and patent infringements thereon which may be involved in the manufacture or use of the apparatus or equipment to be furnished.

6. All goods shall remain the property of the seller until delivered to and accepted by the department.

7. The following chassis, pump, and body specifications have been written to those of the Muskegon Heights Fire Department. Exceptions may be allowed if they meet the full intent

	Bidder Complies	
	Yes	No

and function of the specifications and are equal or superior to those specified and provided, they are listed and fully explained on a separate page entitled "Exceptions to Specifications". The proposals exception list shall refer to the specification by page and paragraph to prevent misinterpretation. All exceptions shall be listed. Any exceptions not taken shall be assumed by the department to be included in the manufacturers proposal and will conform to the published specifications, regardless of the cost to the manufacturer. Failure to adhere to these instructions, or specifications contained herein, will be just cause for rejection of the proposal quotation. Proposals taking total exception to these specifications will not be accepted.

8. All proposals must be valid for a minimum of thirty (30) days from proposal opening date.

9. The department reserves the right to award the contract by sections, or to accept the proposal they shall deem in the best interest, regardless of whether the accepted proposal is low in the amount proposed, and to waive any informalities, omissions, oversights, or irregularities in any proposal and to reject any and all proposals when unsatisfactory.

10. The department does not intend to consider proposals on prototype, experimental, or unproven types of apparatus.

11. These conditions, instructions, and specifications have been developed and written in good faith.

12. A preconstruction conference shall be held at the manufacturers location within thirty (30) days of contract award. Upon completion of the conference, a set of notes and drawings for the department's approval shall be forwarded prior to the start of any construction.

13. The Manufacturers should submit a proposal price for the apparatus, and an itemized proposal price for the accessory equipment.

QUALITY AND WORKMANSHIP

The apparatus and equipment herein specified shall be the manufacturer's latest model of production embodying, the latest improved automotive engineering practices. All materials, workmanship, and finish must be of superior quality and conform to the nature of service and the character to which the apparatus is intended, in order to insure long life, dependability, and low costs of maintenance and repair.

DESIGN CRITERIA

The apparatus shall be designed, constructed, and equipment mounted with due consideration to the distribution of the load to be sustained and to the general type and character of service to which the apparatus will be subjected. All parts of the apparatus shall be sufficiently strong, with ample safety factors provided to withstand the general service under load, meeting both on and off road requirements.

The design of the apparatus must allow for ease of operation, symmetrical proportions, and

	Bidder Complies	
	Yes	No

ready access to the various parts requiring lubrication, inspection, adjustment, and repair.

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

The electrical system shall be designed to meet and exceed the anticipated electrical load requirements of the devices indicated in the specifications. The manufacturer shall provide an amp load performance chart for the apparatus as specified.

The chassis must be designed for fire apparatus use.

WARRANTY REQUIREMENTS

A copy of each of the bidder's standard warranties shall be supplied with the proposal for review.

DELIVERY

A qualified and responsible manufacturer's representative shall deliver the apparatus and equipment, remaining at the department for a period of three (3) consecutive days or a sufficient period of time to instruct personnel in the operation, care, and maintenance of the apparatus and equipment.

Responsibility for the apparatus and equipment shall remain with the manufacturer until satisfactory completion of the acceptance tests and formal acceptance by the department occurs.

To ensure proper break-in of all apparatus components while still under warranty, the apparatus shall be delivered under its own power by the manufacturer. The apparatus and equipment shall be ready for immediate use at the time of delivery.

The apparatus will be inspected upon delivery for compliance with the specifications. Deviations will not be tolerated and will be cause for rejection of apparatus unless listed in the bidder's original proposal.

The apparatus shall be covered by comprehensive and liability insurance during the delivery period. The department will assume the insurance obligation on acceptance and at that time, shall present to the manufacturer a certificate of verification, showing liability, comprehensive and collision insurance coverage.

INFORMATION REQUIRED FROM MANUFACTURER

The manufacturer must supply at the time of delivery at least two (2) copies of the complete operation and maintenance manuals covering the completed apparatus and equipment as delivered, two (2) destination effective wiring diagrams, copies of electrical and mechanical component manuals for equipment purchased on or with the apparatus, and a sketch of the

	Bidder Complies	
	Yes	No

booster tank indicating all dimensions and baffle locations.

INSPECTION TRIPS

Three (3) inspection trip(s) during the construction phase will be provided to the Chief and his designer, with all travel and living expenses paid by the manufacturer. The trips shall allow the department's representative to inspect the apparatus for quality, compliance with the specifications and to make any and all necessary additions and deletions. The travel and living expenses shall be included in the price of the apparatus.

DESIGN SPECIFICATIONS

1. Personnel Capacities

To meet the spirit of N.F.P.A. 1500 paragraph 6.3.1, this apparatus has been designed to transport not more than six (6) people.

6.3 Riding in Fire Apparatus

6.3.1 All persons riding in fire apparatus shall be seated and belted securely to the vehicle by seat belts in approved riding positions and at any time the vehicle is in motion. Standing or riding on tailsteps, sidesteps, running boards or in any other exposed position shall be specifically prohibited.

2. Component Protection

Hydraulic lines, air system tubing, control cables, and electrical lines shall be clipped to the frame or body structure of the apparatus and shall be furnished with metal protective looms or grommets at each point where they pass through body panel or structural members.

3. Vehicle Stability

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

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

c. The difference in weight on the end of each axle, from side to side, when the vehicle is fully loaded and equipped as defined by NFPA shall not exceed 7 percent (7%).

INFORMATION TO BE PROVIDED:

The successful bidder shall supply, at the time of delivery, the following documents:

	Bidder Complies	
	Yes	No

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.
   (e) Front tire size and total rated capacity in pounds.
   (f) Rear tire size and total rated capacity in pounds.
   (g) Chassis weight distribution in pounds with water and manufacturer mounted equipment.
   (h) Engine make, model, serial number, number of cylinders, bore, stroke, displacement and compression ratio, rated horsepower and related speed, and no-load governed speed.
   (i) Type of fuel and fuel tank capacity.
   (j) Electrical system voltage and alternator output in amps.
   (k) Battery make and model, capacity in CCA.
   (l) Transmission make, model, and type.
   (m) Pump to drive through the transmission (yes or no).
   (n) Engine to pump gear ratio and transmission gear ratio used.
   (o) Pump make, model, rated capacity in gpm, serial number, number of stages, and impeller diameter in inches.
   (p) Pump transmission make, model, and serial number.
   (q) Priming device type.
   (r) Type of pump pressure control system.
   (s) Auxiliary pump make, model, rated capacity in gpm, serial number, number of stages, and impeller diameter in inches.
   (t) Water tank certified capacity in gallons.
   (u) Aerial device type, rated vertical height in feet, rated horizontal reach in feet, and rated capacity in pounds.
   (v) Paint numbers.
   (w) Company name and signature of responsible company representative.

2. If the apparatus has a fire pump, the pump manufacturer's certification of suction capability.
3. If the apparatus has a fire pump, a copy of the apparatus manufacturer's approval for stationary pumping applications.
4. If the apparatus has a fire pump, the engine manufacturer's certified brake horsepower curve for the engine shall be furnished, showing the maximum no-load governed speed.
5. If the apparatus has a fire pump, the pump manufacturer's certification of hydrostatic test.
6. If the apparatus has a fire pump, the certification of inspection and test for the fire pump.
7. If the apparatus has an aerial device, the certification of inspection and test for the aerial device.
8. If the apparatus has an aerial device, all the technical information required for inspections to comply with NFPA.

	Bidder Complies	
	Yes	No

9. Weight documents from a certified scale showing actual loading on the front axle, rear axle(s), and overall vehicle (with the water tank full but without personnel, equipment, and hose) shall be supplied with the completed vehicle.
10. Written load analysis and results of the electrical system performance tests.
11. If the apparatus is equipped with a water tank, the certification of water tank capacity.
12. If the apparatus has a fire pump, two (2) copies of the pump operation and maintenance manual.
13. Two (2) destination effective wiring diagrams.
14. Copies of electrical and mechanical component manuals for equipment purchased on or with the apparatus.
15. A sketch of the booster tank indicating all dimensions and baffle locations.
16. If the apparatus has a pump, one (1) certification of third party test.

LENGTH AND/OR HEIGHT LIMITATIONS:

OVERALL HEIGHT:

There shall be no overall height restrictions.

OVERALL LENGTH:

There shall be no overall length restrictions.

CUSTOM CHASSIS:

MODEL

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

MODEL YEAR

The chassis shall have a vehicle identification number that reflects a 2023 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.

	Bidder Complies	
	Yes	No

CAB AND CHASSIS LABELING LANGUAGE

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

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

- Shoreline
- Aerial Stowed
- Aerial Breakers 2
- Air Conditioner
- Cab Tilt Plate
- Air Compressor Breaker
- Battery Conditioner Breaker
- Helmet Caution
- Horn Tag
- Q2B Tag
- Load Center Plate
- Not a Step Label
- Occupancy Tag
- Do Not Move
- Occupants Must Be Seated
- Do Not Stand
- Danger Do Not Weld
- Danger--Untrained Operator
- DEF Fill Access (Including Additional 2907 Optional Labels)
- Battery Direct
- Kneeling
- IFS Air Fault
- Engine Brake
- Retarder
- LR 100 Amp Node
- 300 Amp EPU
- 100 Amp Front O/R Node
- 100 Amp T/T Node
- 100 Amp RR O/R Node
- 10 Amp EPU
- Master Power
- 12 Volt Power

	Bidder Complies	
	Yes	No

- Aerial Hours
- Pump In Drive

Windshield Washer Fluid

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 750 gallons per minute (3000 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. The apparatus of the vehicle shall be supplied and installed by the apparatus manufacturer.

VEHICLE ANGLE OF APPROACH PACKAGE

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

NFPA1901 Angle of Approach definition:
"To determine the angle of approach, place a thin steel strip against the front of the tires where they touch the ground or stretch a tight string from one front tire to the other at the front where they touch the ground. Determine the lowest point (component or equipment) on the vehicle forward of the front tire that would make the smallest angle of approach. Hang a plumb bob from the lowest point and mark the point on the ground where the point of the plumb bob touches. Measure the vertical distance from the ground to the point where the plumb bob was hung (distance *V*). Measure the horizontal distance from the plumb bob point to the steel strip or string running from front tire to front tire (distance *H*). Divide the vertical distance by the horizontal distance. The ratio of *V/H* is the tangent of the angle of approach. If the ratio is known, the angle of approach can be determined from a table of trigonometric functions of angles or from a math calculator. The standard requires a minimum angle of approach of 8.00 degrees: 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

The front gross axle weight rating (GAWR) of the chassis shall be 21,500 pounds.

	Bidder Complies	
	Yes	No

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

GROSS AXLE WEIGHT RATINGS REAR

The rear gross axle weight rating (GAWR) of the chassis shall be 31,000 pounds.

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 drive line 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 1000 gallons (3785liters) to 1250 gallons (4732 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, MFD model (or equivalent) 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 a minimum of four (4) seating positions.

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

The cab shall be constructed using multiple aluminum extrusions in conjunction with aluminum plate, which shall provide proven strength and the truest, flattest body surfaces ensuring less expensive paint repairs if needed. All aluminum welding shall be completed to

	Bidder Complies	
	Yes	No

the American Welding Society and ANSI D1.2-96 requirements for structural welding of aluminum.

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

The cab shall be constructed of 5052-H32 corrosion resistant aluminum plate. The cab shall incorporate tongue and groove fitted 6061-T6 0.13 & 0.19 inch thick aluminum extrusions for extreme duty situations. A single formed, one (1) piece extrusion shall be used for the "A" pillar, adding strength and rigidity to the cab as well as additional roll-over protection. The cab side walls and 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 131.10 inches with 54.00 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 in the non-raised roof area 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 51.88 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 of 40.25 inches wide X 53.50 inches high, from the cab floor to the top of the door opening. The cab shall also include a crew area with up to two (2) cab doors, also large enough for personnel in full firefighting gear. The rear doors shall offer a clear opening of 32.25 inches wide X 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

	Bidder Complies	
	Yes	No

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

The vehicle shall include the Advanced Protection System™ (APS) which shall secure belted occupants and increase the survivable space within the cab. The APS shall selectively deploy integrated systems to protect against injuries in qualifying frontal impact, side impact, and rollover events. The increase in survivable space and security of the APS shall also provide ejection mitigation protection.

The system components shall include:

- Driver steering wheel airbag
- Driver dual knee air bags (patent pending) with energy management mounting (patent pending) and officer knee airbag.
- Large driver, officer, and crew area side curtain airbags
- APS advanced seat belt system - retractor pre-tensioners tighten the seat belts around the occupants, securing the occupants in seats and load limiters play out some of the seat belt webbing to reduce seat belt to chest and torso force upon impact as well as mitigate head and neck injuries
- Heavy truck Restraints Control Module (RCM) - receives inputs from the outboard sensors, selectively deploys APS systems, and records sensory inputs immediately before and during a detected qualifying event
- Integrated outboard crash sensors mounted at the perimeter of the vehicle - detects a qualifying front or side impact event and monitors and communicates vehicle status and real time diagnostics of all critical subsystems to the RCM
- Fault-indicating Supplemental Restraint System (SRS) light on the driver's instrument panel

Frontal impact protection shall be provided by the outboard sensors and the RCM. In a qualifying front impact event the outboard sensors provide inputs to the RCM. The RCM activates the steering wheel airbag, driver side dual knee airbags (patent pending), officer side knee airbag, and advanced seat belts for each occupant in the cab.

Rollover, side impact, and ejection mitigation shall be provided by the outboard sensors and the RCM. In qualifying rollover or side impact events the outboard sensors provide inputs to the RCM. The RCM activates the side curtain airbags and advanced seat belts for each

	Bidder Complies	
	Yes	No

occupant in the cab. The RCM measures roll angle, lateral acceleration, and roll rate to determine if a rollover event or side impact event is imminent or occurring.

In the event of a qualifying offset or other non-frontal impact, the RCM shall determine and intelligently deploy the front impact protection system, the side impact protection system, or both front and side impact protection systems based on the inputs received from the outboard crash sensors.

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

CAB SIDE DRIP RAIL

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

CAB PAINT EXTERIOR

The cab shall be painted 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 entire cab shall be ground by disc to remove any surface oxidation or surface debris which may hinder the paint adhesion. Once the surface is machine ground a

	Bidder Complies	
	Yes	No

high quality acid etching of base primer shall be applied. Upon the application of body fillers and their preparation, the cab shall be primed with a coating designed for corrosion resistance and surface paint adhesion. The maximum thickness of the primer coat shall be 2.00 mils.

The entire cab shall then be coated with an intermediate solid or epoxy surfacing agent 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 a sanding of the cab with 360 grit paper followed by sealing the seams with SEM brand seam sealer.

The cab shall then be painted the specific color designated by the customer with an acrylic urethane type system designed to retain color and resist acid rain and most atmospheric chemicals found on the fire ground or emergency scene. The paint shall have a minimum thickness of 2.00 mils, followed by a clear top coat not to exceed 2.00 mils. The entire cab shall then be baked at 180 degrees for one (1) hour to speed the curing process of the coatings.

CAB PAINT MANUFACTURER

The cab shall be painted with Sikkens paint.

CAB PAINT PRIMARY/LOWER COLOR

The primary/lower paint color shall be: Red

CAB PAINT SECONDARY/UPPER COLOR

The secondary/upper paint color shall be: Black

CAB PAINT EXTERIOR BREAKLINE

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

CAB PAINT PINSTRIPE

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

CAB 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

	Bidder Complies	
	Yes	No

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 onyx black texture finish.

CAB ENTRY DOORS

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

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

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

CAB ENTRY DOOR TYPE

All cab entry doors shall be 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.

AUXILIARY CAB STEPS

The cab shall be equipped with four (4) stirrup style auxiliary steps, one installed below each of the cab door openings. The step frame shall be constructed of 0.19 inch thick 5052-H32 Marine Grade aluminum plate. The step surface shall be constructed of heavy duty aluminum Grip-Strut safety grating which meets or exceeds Federal Specification RRG-1602-latest revision and performs under dry, greasy, muddy, soapy and icy conditions and offers open drainage. The front step surface shall measure 7.69 inches deep X 27.73 inches wide. The rear step surface shall measure 7.69 inches deep X 16.88 inches wide.

CAB STRUCTURAL WARRANTY

	Bidder Complies	
	Yes	No

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.

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

	Bidder Complies	
	Yes	No

- ABS Event
- Seat Occupied Status
- Seat Belt Status
- Master Optical Warning Device Switch Position
- Time
- Date

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

ACCESSORY POWER

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

AUXILIARY ACCESSORY POWER

An auxiliary twelve (12) position Blue Sea Systems 5031 blade type fuse panel shall be installed behind the switch panel. The fuse panel shall be protected by a 40 amp fuse. The panel shall be capable of carrying up to a maximum 40 amp battery direct load.

EXTERIOR ELECTRICAL TERMINAL COATING

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

ELECTRICAL SYSTEM WARRANTY

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

ENGINE

The chassis engine shall be a Cummins L9 engine. The L9 engine shall be an in-line six (6) cylinder, four cycle diesel powered engine. The engine shall offer a rating of 450 horse

	Bidder Complies	
	Yes	No

power at 2100 RPM and shall be governed at 2200 RPM. The torque rating shall feature 1250 foot pounds of torque at 1200 RPM with 543 cubic inches (8.9 liters) of displacement.

The L9 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 2021 emissions standards using cooled exhaust gas recirculation and selective catalytic reduction technology.

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

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

CAB ENGINE TUNNEL

The cab interior shall include an integrated engine tunnel constructed of 5052-H32 Marine Grade, 0.19 of an inch thick aluminum. 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 a high-idle speed rocker switch and an automatic high-idle speed control. It shall be pre-set so when activated, it will operate the engine at the appropriate RPM to increase alternator output. This device shall operate only when the engine is running and the transmission is in neutral with the parking brake set. 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 is released, or when the transmission is placed in neutral.

ENGINE PROGRAMMING ROAD SPEED GOVERNOR

	Bidder Complies	
	Yes	No

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

AUXILIARY ENGINE BRAKE

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

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

AUXILIARY ENGINE BRAKE CONTROL

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

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

The compression brake shall be controlled 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

	Bidder Complies	
	Yes	No

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

REMOTE THROTTLE HARNESS

An apparatus interface wiring harness for the engine and transmission pump interlocks shall be supplied with the chassis. The harness shall include a connector for connection to a chassis pump panel harness supplied by the body builder and shall terminate in the left frame rail behind the cab for connection by the body builder. The harness shall include circuits deemed for a pump panel and shall contain circuits for a hand throttle, and a multiplexed gauge. Separate circuits shall also be included for a pump control switch, "Pump Engaged" and "OK to Pump" indicator lights, open compartment ground, start signal, park brake ground, ignition signal, master power, clean power, customer ignition, air horn solenoid switch, high idle switch and high idle indicator 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.

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

	Bidder Complies	
	Yes	No

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

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

ENGINE COOLING SYSTEM

There shall be a heavy-duty aluminum cooling system designed to meet the demands of the emergency response industry. The cooling system shall have the capacity to keep the engine properly cooled under all conditions of road and pumping operations. The cooling system shall be designed and tested to meet or exceed the requirements specified by the engine and transmission manufacturer and all EPA requirements. The 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.

	Bidder Complies	
	Yes	No

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.

ENGINE PUMP HEAT EXCHANGER

A single bundle type coolant to water heat exchanger shall be installed between the engine and the radiator. The heat exchanger shall be designed to prohibit water from the pump from coming in contact with the engine coolant. This shall allow the use of water from the discharge side of the pump to assist in cooling the engine.

COOLANT HOSES

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

ENGINE COOLANT OVERFLOW BOTTLE

	Bidder Complies	
	Yes	No

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

ENGINE EXHAUST SYSTEM

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

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

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

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

DIESEL EXHAUST FLUID TANK

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

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

The tank fill tube shall be routed under the rear of the cab with the fill neck and splash guard accessible in the top rear step.

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

	Bidder Complies	
	Yes	No

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

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

EMISSIONS SYSTEMS WARRANTY

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

TRANSMISSION

The drive train shall include an Allison model EVS 3000 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 and Castrol TranSynd™ synthetic TES 295 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 select the fifth speed operation without the need to press the mode button.

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.

	Bidder Complies	
	Yes	No

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 and shall send a signal to activate a warning in the instrument panel when levels fall below normal.

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.

	Bidder Complies	
	Yes	No

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 Hale DSD forward pump.

MIDSHIP PUMP GEARBOX DROP

The Hale pump gearbox shall have an "L" (long) drop length.

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.

	Bidder Complies	
	Yes	No

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

A fuel shutoff valve shall be installed in the fuel draw line at the primary fuel filter to allow the fuel filter to be changed without loss of fuel to the fuel pump.

A second 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 of fifty (50) gallons and shall measure 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 strap hanger assemblies with “U” straps bolted midway on the fuel tank front and rear shall be utilized to allow the tank to be easily lowered and removed for service purposes. Rubber

	Bidder Complies	
	Yes	No

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 painted to match the frame components.

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

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

FUEL TANK STRAP MATERIAL

The fuel tank straps shall be constructed of ASTM A-36 hot-dip galvanized steel. The fuel tank straps shall include a natural galvanized finish.

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. The weight capacity for the axle shall be rated to 21,500 pounds FAWR.

FRONT AXLE WARRANTY

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

FRONT WHEEL BEARING LUBRICATION

	Bidder Complies	
	Yes	No

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 and 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. The spring capacity shall be rated at 21,500 pounds.

STEERING COLUMN/ WHEEL

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

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

ELECTRONIC POWER STEERING FLUID LEVEL INDICATOR

	Bidder Complies	
	Yes	No

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

REAR AXLE

The rear axle shall be a Meritor model RS-30-185 single drive axle. The axle shall include precision forged, single reduction differential gearing, and shall have a fire service rated capacity of 33,000 pounds.

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

The axle shall have heavy-duty Hypoid gearing for longer life, greater strength and quieter operation. 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.

	Bidder Complies	
	Yes	No

REAR AXLE WARRANTY

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

REAR WHEEL BEARING LUBRICATION

The rear axle wheel bearings shall be lubricated with oil.

VEHICLE TOP SPEED

The top speed of the vehicle shall be approximately 68 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.

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 385/65R22.5 “L” tubeless radial X Multi HL Z regional tread.

The front tire stamped load capacity shall be 22,000 pounds per axle with a nominal speed rating of 68 miles per hour when properly inflated to 130 pounds per square inch.

The Michelin Intermittent Service Rating maximum load capacity shall be 23,540 pounds per axle with a maximum speed of 68 miles per hour when properly inflated to 130 pounds per square inch.

The Michelin Intermittent Service Rating maximum speed capacity shall be 22,000 pounds per axle with a speed rating of 75 miles per hour when properly inflated to 130 pounds per square inch.

	Bidder Complies	
	Yes	No

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 315/80R-22.5 20PR "L" tubeless radial XDN2 Grip all weather tread.

The rear tire stamped load capacity shall be 33,080 pounds per axle with a nominal speed rating of 75 miles per hour when properly inflated to 130 pounds per square inch.

The Michelin Intermittent Service Rating maximum load capacity shall be 35,396 pounds per axle with a maximum speed of 75 miles per hour when properly inflated to 130 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 12.25 inch aluminum wheels featuring a mirror polish on the outer face. 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 9.00 inch aluminum wheels with a mirror polished outer surface. The inner rear wheels shall be Alcoa hub piloted, 22.50

	Bidder Complies	
	Yes	No

inch X 9.00 inch aluminum wheels with bright machine finish. The hub piloted mounting system shall provide easy installation and shall include two-piece flange nuts.

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 loose traction. The system shall scale the electronic engine throttle back to prevent wheel spin while accelerating on ice or wet surfaces.

A momentary rocker style switch shall be provided and properly labeled “mud/snow”. When the switch is pressed once, the system shall allow a momentary wheel slip to obtain traction under extreme mud and snow conditions. During this condition the ATC light and the light on the rocker switch 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.

	Bidder Complies	
	Yes	No

FRONT BRAKES

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

REAR BRAKES

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

PARK BRAKE

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

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

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

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.

	Bidder Complies	
	Yes	No

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 wheel base, 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 199.00 inches.

REAR OVERHANG

The chassis rear overhang shall be 64.00 inches.

FRAME

	Bidder Complies	
	Yes	No

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 cleaner skid plate
- Radiator skid plate

	Bidder Complies	
	Yes	No

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

- 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 cross hatch adhesion test per ASTM D3359 shall not have a fail of more than ten (10) squares. The pencil hardness test per ASTM D3363 shall have a final post-curved pencil hardness of H-2H. The direct impact resistance test per ASTM D2794 shall have an impact resistance of 120.00 inches per pound at 2 mils.

FRAME ASSEMBLY STRUCTURAL

Purchaser shall receive a Frame Assembly Structural Twenty (20) Years or 100,000 Miles limited warranty in accordance with, and subject to, warranty certificate RFW0304. 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

	Bidder Complies	
	Yes	No

A one piece, two (2) rib wrap-around style, polished stainless steel front bumper shall be provided. The material shall be 10 gauge 304 stainless steel, 12.00 inches high and 99.00 inches wide.

FRONT BUMPER EXTENSION LENGTH

The front bumper shall be extended approximately 24.00 inches ahead of the cab.

FRONT BUMPER APRON

The 24.00 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 2.00 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, 2.00 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 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. The compartment shall include a notched cover constructed of 0.19 inch thick bright embossed aluminum tread plate. The notch shall be located in the left front portion of the cover and shall be 4.00 inches in length with a 2.00 inches wide radius.

FRONT BUMPER COMPARTMENT COVER HARDWARE

The front bumper compartment cover(s) shall include gas cylinder stays which shall hold the cover open. Each cover shall be held in the closed position via a D-ring style latch.

MECHANICAL SIREN

	Bidder Complies	
	Yes	No

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.

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.

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 on the right side outboard of the frame rail in the inboard position.

FRONT BUMPER TOW HOOKS

	Bidder Complies	
	Yes	No

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 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 CONTROL RECEPTACLE

The cab tilt control cable shall include a receptacle which shall be temporarily located on the right hand chassis rail rear of the cab to provide a place to plug in the cab tilt remote control pendant. The tilt pump shall include 8.00 feet of cable with a six (6) pin Deutsch receptacle with a cap.

	Bidder Complies	
	Yes	No

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 have a surface area of 2825.00 square inches and be of a two (2) piece wraparound design for maximum visibility.

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

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

GLASS FRONT DOOR

The front cab doors shall include a window which is 27.00 inches in width X 26.00 inches in height. These windows shall have the capability to roll down completely into the door housing. This shall be accomplished manually utilizing a crank style handle on the inside of the door. A reinforced window regulator assembly shall be provided for severe duty use.

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 include a dark gray automotive tint which shall allow forty-five percent (45%) light transmittance. The dark tint shall aid in cab cooling and help protect passengers from radiant solar energy.

GLASS REAR DOOR RH

	Bidder Complies	
	Yes	No

The rear right hand side door shall include a window which is 27.00 inches in width X 26.00 inches in height. This window shall roll up and down manually utilizing a crank style handle on the inside of the door. A reinforced window regulator assembly shall be provided for severe duty use.

GLASS TINT REAR DOOR RIGHT HAND

The window located in the right hand side rear window shall include a dark gray automotive tint which shall allow forty-five percent (45%) light transmittance. The dark tint shall aid in cab cooling and help protect passengers from radiant solar energy.

GLASS REAR DOOR LH

The rear left hand side door shall include a window which is 27.00 inches in width X 26.00 inches in height. This window shall roll up and down manually utilizing a crank style handle on the inside of the door. A reinforced window regulator assembly shall be provided for severe duty use.

GLASS TINT REAR DOOR LEFT HAND

The window located in the left hand side rear door shall include a dark gray automotive tint which shall allow forty-five percent (45%) light transmittance. The dark tint shall aid in cab cooling and help protect passengers from radiant solar energy.

GLASS SIDE MID RH

The cab shall include a window on the right side behind the front and ahead of the crew door which shall measure 16.00 inches wide X 26.00 inches high. This window shall be fixed within this space and shall be rectangular in shape. The window shall be mounted using self locking window rubber. The glass utilized for this window shall include a green automotive tint unless otherwise noted.

GLASS TINT SIDE MID RIGHT HAND

The window located on the right hand side of the cab between the front and rear doors shall include a dark gray automotive tint which shall allow forty-five percent (45%) light transmittance. The dark tint shall aid in cab cooling and help protect passengers from radiant solar energy.

GLASS SIDE MID LH

The cab shall include a window on the left side behind the front door and ahead of the crew door and above the wheel well which shall measure 16.00 inches wide X 26.00 inches high. This window shall be fixed within this space and shall be rectangular in shape. The window shall be mounted using self locking window rubber. The glass utilized for this window shall include a green automotive tint unless otherwise noted.

	Bidder Complies	
	Yes	No

GLASS TINT SIDE MID LEFT HAND

The window located on the left hand side of the cab between the front and rear doors shall include a dark gray automotive tint which shall allow forty-five percent (45%) light transmittance. The dark tint shall aid in cab cooling and help protect passengers from radiant solar energy.

CLIMATE CONTROL

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

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

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

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

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

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

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

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

	Bidder Complies	
	Yes	No

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 driver's 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 onyx black 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.

	Bidder Complies	
	Yes	No

CAB CIRCULATION FANS FRONT

The cab shall include two (2) all metal 6.00 inch air circulation fans installed in the outer front cab corners. Each fan shall be controlled by an individual toggle switch on each fan. The fans can be used to help defog the windshield or to increase air circulation for passenger comfort.

UNDER CAB INSULATION

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

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

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

The 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.

INTERIOR TRIM FLOOR

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

INTERIOR TRIM

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

REAR WALL INTERIOR TRIM

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

HEADER TRIM

	Bidder Complies	
	Yes	No

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

TRIM CENTER DASH

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

TRIM LH DASH

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

TRIM RH DASH

The right hand dash shall be constructed of 5052-H32 Marine Grade, 0.13 of an inch thick aluminum plate and shall include a glove compartment with a hinged door and a Mobile Data Terminal (MDT) provision. The glove compartment size will measure 14.00 inches wide X 6.38 inches high X 5.88 inches deep. The MDT provision shall be provided above the glove compartment.

ENGINE TUNNEL TRIM

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

POWER POINT DASH MOUNT

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

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

	Bidder Complies	
	Yes	No

than becoming trapped within the stepping surface. The step shall feature a splash guard to reduce water and debris from splashing in to the step. The splash guard shall have drainage holes beneath the back of the step to allow debris and water to flow through rather than becoming trapped within the stepping surface. The stainless steel material shall have a number 8 mirror finish. The lower step shall be mounted to a frame which is integral with the construction of the cab for rigidity and strength. The middle step shall be integral with the cab construction and shall be trimmed with a Flex-Tred® adhesive grit surface material.

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.

CAB DOOR TRIM REFLECTIVE

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

INTERIOR GRAB HANDLE "A" PILLAR

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

INTERIOR GRAB HANDLE FRONT DOOR

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

	Bidder Complies	
	Yes	No

INTERIOR GRAB HANDLE REAR DOOR

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

INTERIOR SOFT TRIM COLOR

The cab interior soft trim surfaces shall be black 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 black vinyl trim.

INTERIOR FLOOR MAT COLOR

The cab interior floor mat shall be black in color.

CAB PAINT INTERIOR DOOR TRIM

The inner door panel surfaces shall be painted with multi-tone onyx black texture finish.

HEADER TRIM INTERIOR PAINT

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

TRIM CENTER DASH INTERIOR PAINT

The entire center dash shall be coated with multi-tone onyx black 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 onyx black texture finish.

TRIM RIGHT HAND DASH INTERIOR PAINT

The right hand dash shall be painted with multi-tone onyx black texture finish.

DASH PANEL GROUP

	Bidder Complies	
	Yes	No

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 twelve (12) rocker switch positions in a six (6) over six (6) switch configuration in the 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 eight (8) switches in a single row configuration. Five (5) of the switches shall be rocker type and the left three (3) shall be the headlight switch, the instrument lamp dimmer switch and the windshield wiper/washer control switch.

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

SWITCHES RIGHT PANEL

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

SEAT BELT WARNING

A Weldon seat belt warning system, integrated with the Vehicle Data Recorder system, shall be installed for each seat within the cab. The system shall activate a digital seat position indicator with a seat position legend and integrated audible alarm in the switch panel.

The warning system shall activate when any seat is occupied with a minimum of 60 pounds and the corresponding seat belt remains unfastened. The warning system shall also activate when any seat is occupied and the corresponding seat belt was fastened in an incorrect sequence. 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

	Bidder Complies	
	Yes	No

be bonded to the back side of the material to help protect the seats from UV rays and from being saturated or contaminated by fluids. Durawear Plus™ 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 back side of the material to help protect the seats from UV rays and from being saturated or contaminated by fluids. Common trade names for this material are Imperial 1200 and Durawear.

SEAT COLOR

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

SEAT BACK LOGO

The seat backs shall include a logo 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.

	Bidder Complies	
	Yes	No

SEAT BACK DRIVER

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

SEAT MOUNTING DRIVER

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

OCCUPANT PROTECTION DRIVER

The driver's position shall be equipped with the Advanced Protection System™ (APS). The APS shall selectively deploy integrated systems to protect against injuries in qualifying frontal impact, side impact, and rollover events. The increase in survivable space and security of the APS shall also provide ejection mitigation protection.

The driver's seating area APS shall include:

- Advanced seat belt system - retractor pre-tensioner tightens the seat belt around the driver, securing the occupant in the seat and the load limiter plays out some of the seat belt webbing to reduce seat belt to chest and torso force upon impact as well as mitigate head and neck injuries.

- Large side curtain airbag - protects the driver's head, neck, and upper body from dangerous cab side surfaces and contact points with intrusive surfaces as a result of a collision as well as provides ejection mitigation protection to the driver in a qualifying event by covering the window and the upper portion of the door.

- Dual knee airbags (patent pending) with energy management mounting (patent pending) - protects the driver's lower body from dangerous surface contact injuries, acceleration injuries, and from intrusion as well as locks the lower body in place so the upper body shall be shall be slowed by the load limiting seat belt.

Steering wheel airbag - protects the driver's head, neck, and upper torso from contact injuries, acceleration injuries, and contact points with intrusive surfaces as a result of a collision.

SEAT OFFICER

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

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

	Bidder Complies	
	Yes	No

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 shall feature a SecureAll™ SCBA locking system which shall be one bracket model and store most U.S. and International SCBA brands and sizes while in transit or for storage within the seat back. The bracket shall be easily adjustable for all SCBA brands and cylinder diameters. All adjustment points shall utilize similar hardware and adjustments shall be made with one tool.

The bracket shall be adjustable to compensate for different cylinder lengths without the use of tools. The adjustment shall be made by raising a lever and moving the top clamp vertically**.**

The bracket system shall be free of straps and clamps that may interfere with auxiliary equipment on SCBA units. The center guide fork shall keep the SCBA tank in place for a safe and comfortable fit in the seat back cavity. The SCBA unit simply needs to be pushed against the pivot arm to engage the patented auto- locking system. Once the lock is engaged, the top clamp shall surround the top of the SCBA tank for a secure fit in all directions.

The SecureAll™ shall include a release handle which shall be integrated into the seat cushion for quick and easy release. This shall eliminate the need for straps or pull cords to interfere with other SCBA equipment.

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

SEAT MOUNTING OFFICER

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

	Bidder Complies	
	Yes	No

OCCUPANT PROTECTION OFFICER

The officer's position shall be equipped with the Advanced Protection System™ (APS). The APS shall selectively deploy integrated systems to protect against injuries in qualifying frontal impact, side impact, and rollover events. The increase in survivable space and security of the APS shall also provide ejection mitigation protection.

The officer's seating area APS shall include:

- Advanced seat belt system - retractor pre-tensioner tightens the seat belt around the officer, securing the occupant in the seat and the load limiter plays out some of the seat belt webbing to reduce seat belt to chest and torso force upon impact as well as mitigate head and neck injuries.

- Large side curtain airbag - protects the officer's head, neck, and upper body from dangerous cab side surfaces and contact points with intrusive surfaces as a result of a collision as well as provides ejection mitigation protection to the officer in a qualifying event by covering the window and the upper portion of the door.

Knee airbags - protects the officer's lower body from dangerous surface contact injuries, acceleration injuries, and from contact points with intrusive surfaces as a result of a collision as well as locks the lower body in place so the upper body shall be slowed by the load limiting seat belt.

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.

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.

	Bidder Complies	
	Yes	No

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 rear facing outboard seat shall feature a Bostrom SecureAll™ self contained breathing apparatus (SCBA) locking system which shall store most U.S. and International SCBA brands and bottle sizes while in transit or for storage within the seat back. The bracket shall be easily adjustable for all SCBA brands and cylinder diameters. All adjustment points shall utilize similar hardware and adjustments shall be made with one tool.

The bracket shall be adjustable to compensate for different cylinder lengths without the use of tools. The adjustment shall be made by raising a lever and moving the top clamp vertically**.**

The bracket system shall be free of straps that may interfere with auxiliary equipment on SCBA units. The center guide fork shall keep the SCBA tank in place for a safe and comfortable fit in the seat back cavity. The SCBA unit simply needs to be pushed against the pivot arm to engage the patented auto-locking system. Once the lock is engaged, the top clamp shall surround the top of the SCBA tank for a secure fit in all directions.

The SecureAll™ shall include a release handle which shall be integrated into the center of the bottom seat cushion for easy access and to eliminate hooking the release handle with clothing or other equipment.

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

	Bidder Complies	
	Yes	No

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 Advanced Protection System™ (APS). The APS shall selectively deploy integrated systems to protect against injuries in qualifying frontal impact, side impact, and rollover events. The increase in survivable space and security of the APS shall also provide ejection mitigation protection.

Each rear facing outer seating position APS shall include:

- APS advanced seat belt system - retractor pre-tensioners tighten the seat belts around each occupant, securing the occupants in seats and load limiters play out some of the seat belt webbing to reduce seat belt to chest and torso force upon impact as well as mitigate head and neck injuries.

Side curtain airbag - protects each occupant's head, neck, and upper body from dangerous cab side surfaces and contact points with intrusive surfaces as a result of a collision as well as provides ejection mitigation protection to each occupant in a qualifying event by covering the windows and walls adjacent to each seating position with an airbag custom designed for each cab configuration.

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.

	Bidder Complies	
	Yes	No

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 forward facing center seat shall feature a SecureAll™ self contained breathing apparatus (SCBA) locking system which shall be one bracket model and store most U.S. and International SCBA brands and sizes while in transit or for storage within the seat back. The bracket shall be easily adjustable for all SCBA brands and cylinder diameters. All adjustment points shall utilize similar hardware and adjustments shall be made with one tool.

The bracket shall be adjustable to compensate for different cylinder lengths without the use of tools. The adjustment shall be made by raising a lever and moving the top clamp vertically**.**

The bracket system shall be free of straps and clamps that may interfere with auxiliary equipment on SCBA units. The center guide fork shall keep the SCBA tank in place for a safe and comfortable fit in the seat back cavity. The SCBA unit simply needs to be pushed against the pivot arm to engage the patented auto- locking system. Once the lock is engaged, the top clamp shall surround the top of the SCBA tank for a secure fit in all directions.

The SecureAll™ shall include a release handle which shall be integrated into the seat cushion for quick and easy release. This shall eliminate the need for straps or pull cords to interfere with other SCBA equipment.

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

OCCUPANT PROTECTION FFC

The forward facing center seat position(s) shall be equipped with the Advanced Protection System™ (APS). The APS shall selectively deploy integrated systems to protect against injuries in qualifying frontal impact, side impact, and rollover events. The increase in survivable space and security of the APS shall also provide ejection mitigation protection.

	Bidder Complies	
	Yes	No

Each forward facing center seating position APS shall include:

- APS advanced seatbelt system - retractor pre-tensioners tighten the seat belts around each occupant, securing the occupants in seats and load limiters play out some of the seat belt webbing to reduce seat belt to chest and torso force upon impact as well as mitigate head and neck injuries.

Side curtain airbag - provides ejection mitigation protection to each occupant in a qualifying event by covering the windows and walls adjacent to crew seating with an airbag custom designed for each cab configuration.

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 one (1) access point to the storage area centered on the front of the seat frame. This access point shall be covered by a hinged door to allow access for storage in the seat box.

SEAT MOUNTING FORWARD FACING CENTER

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

CAB FRONT UNDERSEAT STORAGE ACCESS

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

SEAT COMPARTMENT DOOR FINISH

All underseat storage compartment access doors shall have a multi-tone onyx black 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.

	Bidder Complies	
	Yes	No

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

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.

	Bidder Complies	
	Yes	No

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 rocker switch in the mirror control panel on the left side dash.

TRIM REAR WALL EXTERIOR

The exterior rear wall of the cab shall include an overlay of 3003-H22 aluminum tread plate which shall be 0.07 inches thick. This overlay shall cover the entire rear wall of the cab.

CAB FENDER

Full width wheel well liners shall be installed on the extruded cab to limit road splash and enable easier cleaning. Each two-piece liner shall consist of an inner liner 16.00 inches wide made of vacuum formed ABS composite and an outer fenderette 5.00 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) Spartan emblems. There shall be one (1) installed on the front air intake grille and one (1) emblem on each of the cab sides. The cab shall also include one (1) Advanced Protection System shield emblem on each front door.

IGNITION

A master battery system with a keyless start ignition system shall be provided. Each system shall be controlled by a one-quarter turn Cole Hersee switch, both of which shall be mounted to the left of the steering wheel on the dash. A chrome push type starter button shall be provided adjacent to the master battery and ignition switches.

Each switch shall illuminate a green LED indicator light on the dash when the respective switch is placed in the “ON” position.

The starter button shall only operate when both the master battery and ignition switches are in the “ON” position.

BATTERY

	Bidder Complies	
	Yes	No

The single start electrical system shall include six (6) 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 air flow and help prevent moisture build up. The batteries shall be held in place by non-conducting phenolic resin hold down boards.

BATTERY BOX COVER

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

BATTERY CABLE

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

BATTERY JUMPER STUD

The starting system shall include battery jumper studs. These studs shall be located in the forward most portion of the driver's side lower step, 8.00 inches apart. The studs shall allow the vehicle to be jump started, charged, or the cab to be raised in an emergency in the event of battery failure.

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 40 LPC battery conditioner shall be supplied. The battery conditioner shall provide a 40 amp output for the chassis batteries and a 15 amp output circuit

	Bidder Complies	
	Yes	No

for accessory loads. The battery conditioner shall be mounted in the cab in the LH rear facing outer seating position.

BATTERY CONDITIONER DISPLAY

A Kussmaul battery conditioner display shall be supplied. The battery conditioner display shall be mounted in the cab, viewable through the cab mid side window behind the left front door.

AUXILIARY AIR COMPRESSOR

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

ELECTRICAL INLET LOCATION

An electrical inlet shall be installed on the left hand side of 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's connected to.

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

ELECTRICAL INLET CONNECTION

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

ELECTRICAL INLET COLOR

The electrical inlet connection shall include a yellow cover.

	Bidder Complies	
	Yes	No

HEADLIGHTS

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

HEADLIGHT LOCATION

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

FRONT TURN SIGNALS

The front fascia shall include two (2) Whelen model 600 4.00 inches X 6.00 inches programmable amber LED turn signals which shall be installed in an outboard position within the front fascia chrome bezel.

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 through a rocker switch within easy reach of the driver. There shall be a dimmer switch within easy reach of the driver to adjust the brightness of the dash lights. The headlamps shall be equipped with the "Daytime Running" light feature, which shall illuminate the headlights when the ignition switch is in the "On" position and the parking brake is released.

LIGHTBAR SWITCH

The light bar shall be controlled by a rocker switch located on the switch panel. There shall be an additional rocker switch to control the clear lights only. The switches shall be clearly labeled for identification.

INTERIOR OVERHEAD LIGHTS

	Bidder Complies	
	Yes	No

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.

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.

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 a rocker switch.

SIDE SCENE LIGHTS

The side of the cab shall include two (2) Whelen 900 series 9SC0ENZR model scene lights, one (1) each side which shall be surface mounted with a chrome bezel. The Whelen lights shall offer LED lighting at a gradient 32-degree angle.

SIDE SCENE LIGHT LOCATION

	Bidder Complies	
	Yes	No

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) rocker switches located in the switch panel, one (1) for each light, and by opening the respective side cab doors.

GROUND LIGHTS

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

GROUND LIGHTS

The ground lighting shall be activated when the parking brake is set, by the opening of the door on the respective cab side, and a rocker switch in the dash panel.

LOWER CAB STEP LIGHTS

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

INTERMEDIATE STEP LIGHTS

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

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 include a polycarbonate lens, a housing which is vibration welded and a bulb which shall be shock mounted for extended life. The light shall activate automatically when the cab is tilted.

DO NOT MOVE APPARATUS LIGHT

	Bidder Complies	
	Yes	No

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 master switch shall be included in the main rocker switch panel. The switch shall be a rocker type, red in color and labeled “Master” for identification. The switch shall feature control over all devices wired through it. Any warning device switch left in the “ON” position shall automatically power up when the master switch is activated.

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 rocker switch on the switch panel. The rocker switch shall be clearly labeled for identification.

INBOARD FRONT WARNING LIGHTS

The cab front fascia shall include two (2) Whelen 600 series 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.

FRONT WARNING SWITCH

The front warning lights shall be controlled via rocker switch on the panel. This switch shall be clearly labeled for identification.

	Bidder Complies	
	Yes	No

INTERSECTION WARNING LIGHTS

The chassis shall include two (2) Whelen 600 series Super LED intersection warning lights, one (1) each side. The lights shall feature multiple flash patterns including steady burn for solid colors and multiple flash patterns for split colors.

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 600 series 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 INTERSECTOR WARNING SWITCH

The side and intersector warning lights shall be controlled by a rocker switch on the switch panel. This switch shall be clearly labeled for identification.

TANK LEVEL LIGHTS

There shall be two (2) Whelen Strip-Light Plus XL tank lights surface mounted within a chrome bezel.

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

	Bidder Complies	
	Yes	No

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.

SIREN CONTROL HEAD

A Whelen 295HFS2 electronic siren control head with remote amplifier shall be provided and flush mounted in the switch panel with a location specific to the customer's needs. The siren shall feature 200-watt output, hands free mode and shall be in "standby" mode awaiting instruction. The siren shall offer radio broadcast, public address, wail, yelp, or piercer tones and hands free operation which shall allow the operator to turn the siren on and off from the horn ring if a horn/siren selector switch option is also selected.

STEERING WHEEL HORN BUTTON SELECTOR SWITCH

A rocker switch shall be installed in the switch panel between the driver and officer to allow control of either the electric horn or the air horn from the steering wheel horn button. The electric horn shall sound by default when the selector switch is in either position to meet FMCSA requirements.

AUDIBLE WARNING LH FOOT SWITCH

A foot switch wired to actuate the mechanical siren(s) shall be supplied for installation in the front section of the cab for driver actuation.

MECHANICAL SIREN FOOT SWITCH LH

The mechanical siren foot switch shall be a Linemaster model 491-S.

MECHANICAL SIREN FOOT SWITCH LH LOCATION

The mechanical siren foot switch shall be located on the left hand side accessible to the driver between the steering column and the door.

MECHANICAL SIREN FOOT SWITCH LH POSITION

The mechanical siren foot switch shall be positioned outboard of any other foot switch, if applicable.

	Bidder Complies	
	Yes	No

AUDIBLE WARNING LH FOOT SWITCH BRACKET

A 30.00 degree angled foot switch bracket, wide enough to accommodate (2) foot switches, shall be installed outboard of the steering column for specified driver accessible foot switch activations.

AUDIBLE WARNING RH FOOT SWITCH

A foot switch wired to actuate the mechanical siren(s) shall be supplied for installation in the front section of the cab for officer actuation.

MECHANICAL SIREN FOOT SWITCH RH

The mechanical siren foot switch shall be a Linemaster model 491-S.

MECHANICAL SIREN FOOT SWITCH RH LOCATION

The mechanical siren foot switch shall be temporarily tied up with a coiled wire drop at the firewall inboard for installation by the customer on the right hand side accessible to the officer.

AIR HORN AUXILIARY ACTIVATION

The air horn activation shall be accomplished by two (2) lanyard cables, one (1) on the left hand side accessible to the driver and one (1) on the right hand side accessible to the officer. An air horn activation circuit shall be provided to the chassis harness pump panel harness connector.

MECHANICAL SIREN BRAKE/AUXILIARY ACTIVATION

A red push button type momentary type siren brake shall be provided in the switch panel on the dash.

MECHANICAL SIREN INTERLOCK

The siren shall only be active when master warning switch is on to prevent accidental engagement.

BACK-UP ALARM

An ECCO model 575 backup alarm shall be installed at the rear of the chassis with an output level of 107 dB. The alarm shall automatically activate when the transmission is placed in reverse.

INSTRUMENTATION

	Bidder Complies	
	Yes	No

An ergonomically designed instrument panel shall be provided. Each gauge shall be backlit with LED lamps. Stepper motor movements shall drive all gauges. The instrumentation system shall be multiplexed and shall receive ABS, engine, and transmission information over the J1939 data bus to reduce redundant sensors and wiring.

A twenty eight (28) icon lightbar message center with integral LCD odometer/trip odometer shall be included. The odometer shall display up to 999,999.9 miles. The trip odometer shall display 9,999.9 miles. The LCD message center screen shall be capable of custom configuration by the users for displaying certain vehicle status and diagnostic functions.

The instrument panel shall contain the following gauges:

One (1) three-movement gauge displaying vehicle speed, fuel level, and Diesel Exhaust Fluid (DEF) level. The primary scale on the speedometer shall read from 0 to 100 MPH, and the secondary scale on the speedometer shall read from 0 to 160 KM/H. The scale on the fuel and DEF level gauges shall read from empty to full as a fraction of full tank capacity. Red indicator lights in the gauge and an audible alarm shall indicate low fuel or low DEF at 1/8th 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 0 to 3000 RPM. The scale on the air pressure gauges shall read from 0 to 150 pounds per square inch (PSI) with a red line zone indicating critical levels of air pressure. Red indicator lights in the gauge and an audible alarm shall indicate low air pressure.

One (1) four-movement gauge displaying engine oil pressure, coolant temperature, voltmeter, and transmission temperature shall be included. The scale on the engine oil pressure gauge shall read from 0 to 100 pounds PSI with a red line zone indicating critical levels of oil pressure. A red indicator light in the gauge and audible alarm shall indicate low engine oil pressure. The scale on the coolant temperature gauge shall read from 100 to 250 degrees Fahrenheit (°F) with a red line zone indicating critical coolant temperatures. A red indicator light in the gauge and audible alarm shall indicate high coolant temperature. The scale on the voltmeter shall read from 9 to 18 volts with a red line zone indicating critical levels of battery voltage. A red indicator light in the gauge and an audible alarm shall indicate high or low system voltage. The low voltage alarm shall indicate when the system voltage has dropped below 11.8 volts for more than 120 seconds in accordance with the requirements of NFPA 1901. The scale on the transmission temperature gauge shall read from 100 to 300 degrees °F with a red line zone indicating critical temperatures. A red indicator light in the gauge and an audible alarm shall indicate a high transmission temperature.

The light bar portion of the message center shall include twenty-eight (28) LED backlit indicators. The lightbar shall be split with fourteen (14) indicators on each side of the LCD message screen. The lightbar shall contain the following indicators and produce the following audible alarms when supplied in conjunction with applicable configurations:

	Bidder Complies	
	Yes	No

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

	Bidder Complies	
	Yes	No

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 red LED backlighting.

CAMERA

An FRC branded inView 360-HD™ heavy duty 360° camera system powered by SEON shall be supplied. Three (3) HD cameras with box shaped housing shall be shipped loose for OEM installation in the body to afford the driver a clear view to the rear and sides of the vehicle and one (1) HD camera shall be mounted on the front of the cab, above the windshield.

The system shall provide a dual camera view. One (1) view shall be a stitched bird's eye 360.00 degrees view around the truck and one (1) shall be a direct feed from a single camera. This feed shall display the rear camera when the transmission is placed in reverse, the left or right camera with the activation of the respective side turn signal, or the front camera at all other times.

CAMERA DISPLAY

The camera system shall be wired to a 7.00 inch flip down HD monitor which shall include a color display and day and night brightness modes installed above the driver position.

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

	Bidder Complies	
	Yes	No

construction and gold plated contact design. The antenna base shall be chassis builder supplied.

COMMUNICATION ANTENNA CABLE ROUTING

The antenna cable shall be routed from the antenna base mounted on the roof to the area 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 inside the center rocker switch console.

CAB EXTERIOR PROTECTION

The cab face shall have a removable plastic film installed over the painted surfaces to protect the paint finish during transport to the body manufacturer.

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 a total of four (4) door keys for the manual door locks.

DIAGNOSTIC SOFTWARE OCCUPANT PROTECTION

Diagnostic software for the Spartan Advanced Protection System shall be available for free download from the Spartan Chassis website to Spartan authorized OEMs, dealers and service centers, as well as the vehicle owner.

The software has been validated to be compatible with the following RP1210 interface adapters:

- Dearborn Group DPA4 Plus

	Bidder Complies	
	Yes	No

- Noregon Systems JPRO® DLA+
- Cummins INLINE5
- Cummins INLINE6
- NexIQ™ USB-Link™

The software and adapter utilize the SAE J1939-13 heavy duty nine (9) pin connector which is located below the driver's side dash to the left of the steering column.

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.

PAINT CONFIRMATION

There shall be a paint confirmation letter sent to the body manufacturer with paint spray outs to confirm the cab primary paint color or primary and secondary paint color as specified by the paint options.

SALES TERMS

The sale of the chassis shall be governed by the terms contained on the Sales Terms – Acceptance of Purchase Order document, a copy of which is attached to this option.

	Bidder Complies	
	Yes	No

DRIVELINE LAYOUT CONFIRMATION

During the design phase of the chassis the Spartan 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. The OEM engineer shall provide approval to the driveline engineer prior to driveline bills of materials being released.

3D CHASSIS LAYOUT

A three dimensional (3D) layout of the chassis shall be provided to the OEM engineering group for use in designing the OEM body.

The layout shall include the following:

Cab
Frame
Bumper
Front Towing Device
Front Axle
Front Suspension
Cab Tilt
Exhaust
Air Drier
Battery Boxes & Covers
Rear Axle
Rear Suspension
Fuel Tank

CHASSIS MODIFICATIONS:

MUD FLAPS:

Each rear fender shall be extended with a black rubber mud flap, thus preventing splash and road debris from damaging the apparatus body.

WHEEL DRESS HUB AND NUT COVERS:

The front and rear wheels shall be dressed with polished hub covers and lug nut covers.

LABELS:

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

--Engine Oil

	Bidder Complies	
	Yes	No

--Engine Coolant
--Chassis Transmission Fluid
--Pump Transmission Lubrication Fluid
--Pump Primer Fluid (if applicable)
--Drive Axle(s) Lubrication Fluid
--Air-Conditioning Refrigerant
--Air-Conditioning Lubrication Oil
--Power Steering Fluid
--Cab Tilt Mechanism Fluid
--Transfer Case Fluid
--Equipment Rack Fluid
--CAFS Air Compressor System Lubricant
--Generator System Lubricant
--Front Tire Cold Pressure
--Rear Tire Cold Pressure
--Maximum Tire Speed Ratings

A final manufacturer's certification of the GVWR or GCWR along with a certification of each GAWR, shall be supplied on a label affixed to the vehicle.

A sign that reads "Occupants Must Be Seated and Belted When Apparatus Is in Motion" shall be provided. The sign shall be visible from each seated position.

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 stating the overall height of the vehicle in feet and inches, the overall length of the vehicle in feet and inches, and the GVWR in tons shall be provided and mounted. The sign shall be visible to the driver of the vehicle while seated.

A label stating “Do Not Wear Helmet While Seated” shall be visible from each seating position.

FUEL TANK:

The chassis shall incorporate a rear fuel tank installed by the chassis manufacturer. The fill and vent shall be installed behind the left rear wheel in a recessed housing with a hinged stainless steel door, Model 101426. The fill shall be labeled with the type of fuel intended.

CAB TILT PENDANT CONNECTION:

The chassis supplied cab tilt connection shall be mounted on the right side of the apparatus. For a pumper, the receptacle shall be located on the discharge panel. For a rescue, the receptacle shall be located in the R1 compartment.

The chassis supplied hose tray shall incorporate one (1) seat belt assembly in the center to

	Bidder Complies	
	Yes	No

retain the hose within the tray during travel.

AIR LIMITOR:

A limitor valve shall be installed on the chassis air reserve tank, eliminating the use of all air accessories when the chassis air pressure is under 100 psi., thus reserving all available air for braking effort.

HELMET STORAGE:

To meet the intent of NFPA 14.1.8.4.1, the helmet for each occupant shall be stored in an exterior compartment.

EMS COMPARTMENT(S):

One (1) EMS compartment(s) shall be installed in the chassis cab in the specified location(s). The exterior of each EMS compartment shall be spatter finished to match the cab interior. The interior of each shall remain natural finish aluminum.

The EMS Compartment shall be located behind the doghouse between the rear facing seats.

The compartment shall incorporate die cut black Hypalon webbing over the opening. The Hypalon shall be retained with shock cord and nylon clips.

EMS COMPARTMENT LIGHTS - LED STRIP:

Each cab EMS compartment shall incorporate E45 Series LED strip lights to illuminate the entire area. The lights shall run the entire height of the compartment on each side of the door opening. A switch shall be provided on the exterior of the compartment on the left (driver's) side to activate the lights. The lighting shall meet the requirements of NFPA 13.10.5

Vertical Unistrut Tracking shall be provided in each EMS compartment

Two (2) full depth adjustable shelf (ves) shall be provided in the EMS compartment(s)

120 VOLT POWER STRIP:

One (1) 120-Volt power strip(s), model TLP88USBB, shall be installed in the EMS compartment. Each power strip will have eight (8) on/off switch controlled, continuously powered outlets, two (2) 2.1 amp USB outlets and a fifteen (15) amp circuit breaker. Each power strip shall be powered from the shoreline connection and hard wired to the apparatus for dependability.

PUMP AND PIPING:

MIDSHIP PUMP:

	Bidder Complies	
	Yes	No

MANUFACTURER: Hale Fire Pump Co.
MODEL: DSD150

CAPACITY: 1500 gpm. @ 150 psi.
SUCTION SIZE: 6" NST

PUMP ASSEMBLY

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 1500 gallons per minute (U.S. GPM), NFPA-1901 rated performance.

The entire pump shall be assembled and tested at the pump manufacturer's factory.

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.

The entire pump 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 Pamphlet No. 1901. Pump shall be free from objectionable pulsation and vibration.

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 not acceptable.

Pump body shall be vertically split, on a single plane for easy removal of entire impeller assembly including clearance rings

Pump shaft to be rigidly supported by two bearings for minimum deflection. The bearings shall be heavy-duty, deep groove ball bearings in the gearbox and they shall be splash lubricated.

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

Impeller clearance rings shall be bronze, easily renewable without replacing impeller or pump volute body.

The pump shaft shall be heat-treated, electric furnace, corrosion resistant stainless steel. Pump shaft must be sealed with double-lip oil seal to keep road dirt and water out of gearbox.

	Bidder Complies	
	Yes	No

GEARBOX

Pump gearbox shall be of sufficient size to withstand up to 16,000 lbs. ft. of torque of the engine. The drive unit shall be designed of ample capacity for lubrication reserve and to maintain the proper operating temperature.

The gearbox drive shafts shall be of heat-treated chrome nickel steel and at least 2¾" in diameter, on both the input and output drive shafts. They shall withstand the full torque of the engine.

All gears, both drive and pump, shall be of 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.)

The pump ratio shall be selected by the apparatus manufacturer to give maximum performance with the engine and transmission selected.

SUCTION PIPING

The suction piping shall be 6" 304 stainless steel piping. The piping shall be heliarc welded with a smooth interior tube for laminate flow. To assure flow, the suction shall have a 6" cast stainless steel yoke designed in the eye of the impeller area. The suction arms on each side shall be designed for future installation of built-in butterfly valves.

DISCHARGE PIPING

The discharge manifold shall be manufactured of stainless steel rectangular tubing. The discharge manifold shall be pressure tested prior to installation on the pumping system.

PRIMING PUMP:

The priming pump shall be a Trident Emergency Products compressed air-powered, high efficiency, multi-stage, venturi based AirPrime™ System. All wetted metallic parts of the priming system are to be of brass and stainless steel construction. A single panel mounted control will activate the priming pump and open the priming valve to the pump. The priming system shall have a five year warranty.

The priming pump shall be controlled from the pump operator's panel.

DRIVELINES:

The chassis drivelines shall be modified to accept the pump drivelines. The pumping system drivelines shall be manufactured by the apparatus manufacturer. The drivelines shall be professionally balanced by the apparatus manufacturer to ensure complete system balance.

	Bidder Complies	
	Yes	No

6" SUCTION:

One (1) 6" NST suction shall be located on each side of the apparatus body. The suctions shall be open and not gated. An inlet screen and a 6" handle cap shall be included.

HIGH FLOW BALL INTAKE VALVE

Two (2) Task Force Tips model #AP1ST-NX manually operated lightweight aluminum high flow straight inlet ball intake valve shall be provided. The unit shall be equipped with an adjustable pressure relief valve under the main valve body. The valve shall be controlled with an NFPA compliant slow-close hand wheel gear operator which can be configured for left or right hand operation. A 3/4" bleeder valve shall be provided to exhaust excess air or water from the valve and hoseline. A position indicator shall be provided to allow for quick visualization of the status of the valve in the open, closed or partial positions. For maximum corrosion protection the aluminum casting shall be hardcoat anodized, with a powder coat internal and external finish and all components typically facing the wet side of the valve shall be constructed from stainless steel.
The connections shall be: 5" Storz rigid and a 6" female NH swivel long handle connection and include polymer bearing strips for prevention of galvanic corrosion. The unit shall be covered by a five-year warranty.

LOCATION:

SHORT SUCTION MANIFOLDS:

The pump manifold on each side of the vehicle shall be equipped with a "short" suction tube to allow the attachment of adapters without excessive overhang.

PUMP DRAINS:

The entire pump and its controls shall be drainable with a master drain piped to the lowest points of the pump and its control piping. The master drain shall be of a threaded design that will seal all drain points without allowing recycle.

HALE MECHANICAL SEAL:

Optional mechanical seal in place of pump packing. One (1) only required on the suction (inboard) side of the pump. The mechanical seal must be 2" 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.

AIR PUMP SHIFT:

The shifting mechanism shall be a heat-treated, hard anodized aluminum power cylinder, with

	Bidder Complies	
	Yes	No

stainless steel shaft. The assembly shall be plumbed utilizing a 3/8" air line for maximum performance. An in-cab control for rapid shift shall be provided that locks in road or pump.

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

INTAKE PRESSURE RELIEF VALVE

One (1) Task Force Tips model #A1860 pressure relief valve shall be provided. The valve shall have an easy to read adjustment range from 90 to 300 PSI with easy to read 90, 125, 150, 200, 250, 300 psi settings and an "OFF" position. Pressure adjustment can be made utilizing a ¼" hex key, 9/16" socket or 14mm socket. For corrosion resistance the cast aluminum valve shall be hardcoat anodized with a powder coat interior and exterior finish. The valve shall be configured for either a Waterous or Hale pump, and have a 2-1/2" male NH threaded discharge outlet and a "DO NOT CAP" label near discharge outlet. The valve shall meet NFPA 1901 requirements for pump inlet relief valve. The unit shall be covered by a five-year warranty.

REQUIRED PUMP TESTING:

If the fire pump has a rated capacity of 750 gpm or greater capacity, the pump shall be tested after the pump and all its associated piping and equipment have been installed on the apparatus. The tests shall be conducted at the apparatus manufacturer's facility and certified by an EVT Certified pump operator. The certification shall include (at least) the following tests: the pumping test, the pumping engine overload test, the pressure control system test, the priming device tests, and the vacuum test. If the apparatus is equipped with a water tank, the water tank to pump flow test shall be included.

A test plate shall be provided at the pump operator's position that gives the following information: the rated discharges and pressures, the speed of the engine determined by the certification test for each unit, the position of the parallel/series pump as used, and the no-load governed speed of the engine stated by the engine manufacturer on a certified brake horsepower curve. The plate shall be completely stamped with all information at the factory and attached to the vehicle prior to shipping.

PUMP CERTIFICATION:

Upon final apparatus delivery, the original copy of the certificate of inspection by an independent third party shall be furnished.

The pumping system shall be capable of delivering:

100 % of rated capacity at 150 psi. net pump pressure

	Bidder Complies	
	Yes	No

70 % of rated capacity at 200 psi. net pump pressure
50 % of rated capacity at 250 psi. net pump pressure

PUMP MODULE - SIDE MOUNT:

An incorporated pump module shall be located between the chassis cab and the front of the body.

The pump operator's panel shall be located on the left side of the apparatus and the suction/discharge panel shall be located on the right side of the apparatus.

The left pump operator's panel and the right discharge panel shall be illuminated with the compartment interior lighting. One (1) additional compartment light shall be located ahead of hte compartment divider on each side.

An automotive rubber seal shall be adhered to the pump panel to reduce vibration that may occur during pump operation or road application. The panel shall be attached to the framing with 3/16" pin, 1" knuckle, continuous stainless steel hinges. The hinges shall be attached with stainless steel fasteners.

The top mount operator's panel shall be hinged for access to the individual gauges and the electrical components. The suction/discharge panels shall have removable panels for pump, valve, and piping access. **Each suction/discharge panel shall be secured with a four (4) latch (approximate) system**.

All pump panel gauges and controls shall be identified with color-coded tags.

PUMP OPERATOR'S PANEL:

The pump operator's panel shall include the following:

PRESSURE GOVERNOR and MONITORING DISPLAY

One (1) Fire Research PumpBoss series PBA401-D00 pressure governor and monitoring display kit shall be installed. The kit shall include a control module, intake pressure sensor, discharge pressure sensor, and cables. The control module case shall be waterproof and have dimensions not to exceed 6 3/4" high by 4 5/8". The control knob shall be 2" in diameter with no mechanical stops, have a serrated grip, and a red idle push button in the center. It shall not extend more than 1 3/4" from the front of the control module. Inputs for monitored engine information and outputs for engine control shall be on the J1939 databus. Inputs from the pump discharge and intake pressure sensors shall be electrical.

The following continuous displays shall be provided:
Engine RPM; shown with four daylight bright LED digits more than 1/2" high
Check engine and stop engine warning LEDs
Engine oil pressure; shown on a dual color (green/red) LED bar graph display

	Bidder Complies	
	Yes	No

Engine coolant temperature; shown on a dual color (green/red) LED bar graph display
Transmission Temperature: shown on a dual color (green/red) LED bar graph display
Battery voltage; shown on a dual color (green/red) LED bar graph display
Pressure and RPM operating mode LEDs
Pressure / RPM setting; shown on a dot matrix message display
Throttle ready LED.
The dot-matrix message display shall show diagnostic and warning messages as they occur. It shall show monitored apparatus information, stored data, and program options when selected by the operator. All LED intensity shall be automatically adjusted for day and night time operation.
The program shall store the accumulated operating hours for the pump and engine to be displayed with the push of a button. It shall monitor inputs and support audible and visual warning alarms for the following conditions:
High Battery Voltage
Low Battery Voltage (Engine Off)
Low Battery Voltage (Engine Running)
High Transmission Temperature
Low Engine Oil Pressure
High Engine Coolant Temperature
Out of Water (visual alarm only)
No Engine Response (visual alarm only).
The program features shall be accessed via push buttons located on the front of the control module. There shall be a USB port located at the rear of the control module to upload future firmware enhancements.

The governor shall operate in two control modes, pressure and RPM. No discharge pressure or engine RPM variation shall occur when switching between modes. A throttle ready LED shall light when the interlock signal is recognized. The governor shall start in pressure mode and set the engine RPM to idle. In pressure mode the governor shall automatically regulate the discharge pressure at the level set by the operator. In RPM mode the governor shall maintain the engine RPM at the level set by the operator except in the event of a discharge pressure increase. The governor shall limit a discharge pressure increase in RPM mode to a maximum of 30 psi. Other safety features shall include recognition of no water conditions with an automatic programmed response and a push button to return the engine to idle.

The pressure governor and display shall be programmed to interface with a Cummins engine.

MASTER GAUGES:

One (1) 4½" compound gauge wth a range of 30-0-400 PSI.

One (1) 4½" pressure gauge with a range of 0-400 PSI

WHELEN LED STRIP-LITE TANK GAUGE:

The apparatus shall be equipped with surface mounted Whelen PSTANK2 LED strip-lite tank

	Bidder Complies	
	Yes	No

status lights. The strips will feature four color LEDs, full tank - green, ¾ tank - blue, ½ tank amber and ¼ tank red, and measure 1" wide x 11½" high x 1 3/8" thick. Three (3) strips will be located on the apparatus; one (1) chassis supplied each side of the cab, and one (1) at the rear.

In addition to the LED strip-lite display, a FRC TankVision level gauge will be located on the pump operator's panel.

TANK INDICATOR REMOTE LIGHT DRIVER

One (1) Fire Research TankVision model WLA290-A00 remote light driver shall be installed. The driver shall provide four (4) separate outputs to control remote lights. The lights shall show 1/4, 1/2, 3/4, and full tank. When power is applied the driver shall run a test and cycle each remote light on and off. When the tank is less than 1/4 full the 1/4 tank light shall blink.

The remote light driver shall receive input information over a single wire from a Fire Research TankVision primary indicator.

LINE READING GAUGES:

One (1) line reading gauge supplied for each discharge. The gauge shall have a 2½ diameter face with a graduated output scale of 0-400 PSI with black print on a bright white background. The gauge shall be constructed with a Zytel housing, acrylic lens and polished stainless steel bezel. The Zytel nylon case shall be temperature compensated with an internal breathing diaphragm to permit a fully filled case and to allow for a rigid lens with a distortion free viewing area.

A 1/4" brass male NPT fitting shall be centrally located on the rear of the housing and feature the Kem-X socket and freeze protection system that isolates the gauge from contaminants. The gauge utilizes a phosphor bronze Bourdon tube filled with a freeze proof liquid isolated by a diaphragm. The gauge shall be filled with low temperature glycerin for an operating range of -40 to +150 degrees Fahrenheit, which prevents bouncing of the readout needle and provides for an accuracy rating of plus or minus 1% across the entire scale of the gauge.

One (1) tank gauge receiver

One (1) recycle/tank fill

One (1) primer control

The lights shall be activated by a switch located on the pump operator's panel.

COLOR CODED TAGS:

Color coded tags with chrome plated bezels shall be provided. Unless otherwise specified all tags shall be color coded to NFPA recommendations and shall be located at the control

	Bidder Complies	
	Yes	No

location, intake/discharge location, and at the drain port location.

NFPA recommendations:

Preconnect #1 or front bumper jump line	Orange
Preconnect #2	Red
Preconnect #3 or discharge #1	Yellow
Preconnect #4 or discharge #2	White
Discharge #3	Blue
Discharge #4	Black
Discharge #5	Green
Deluge/deck gun	Silver
Water tower	Purple
Large-diameter hose	Yellow with white border
Foam line(s)	Red with white border
Booster reel(s)	Gray
Inlets	Burgundy

TEST PORTS:

Vacuum and pressure test ports shall be provided on the pump operator's panel for connection of the pump test gauges.

All other indicator lights required by NFPA 1901

PUSH BUTTON ON PUMP PANEL FOR AIR HORNS:

There shall be a push button provided on the pump panel to activate the air horns.

STAINLESS STEEL PUMP PANELS:

The pump operator's panel and discharge panels shall be manufactured of 12-gauge stainless steel and shall include a full width stainless steel light hood which shall have three (3) E10 Series LED lights.

The side discharge panel on the passenger side of the apparatus shall be manufactured of 12-gauge stainless steel and shall include two (2) Eon E03 Series LED lights on the side panel above the discharge panel.

The lights activated by the pump panel light switch.

The lights shall be activated by a switch located on the pump operator's panel.

2 ½" DISCHARGE PIPING:

Two (2) 2 ½" discharge(s) shall be located on the left side of the apparatus. Each discharge

	Bidder Complies	
	Yes	No

valve shall be located behind the body panel and controlled from the side control pump operator's panel. Each discharge shall include a self-locking 2½" quarter-turn ball valve, a 2½" chrome cap with chain, and a sweep elbow of at least 30 degrees downward.

Each above valve shall be manually controlled.

2 ½" DISCHARGE PIPING:

One (1) 2 ½" discharge(s) shall be located on the right side of the apparatus. Each discharge valve shall be located behind the body panel and shall be controlled from the side control pump operator's panel. Each shall include a self-locking 2½" quarter-turn ball valve, a 2½" chrome cap with chain, and a sweep elbow of at least 30 degrees downward.

Each above valve shall be manually controlled.

3" DISCHARGE(S), APPARATUS RIGHT SIDE:

One (1) 3" discharge(s) shall be located on the right side of the apparatus with each valve behind the body panel. Each discharge shall be controlled from the top mount pump operator's panel. A 2½" gauge shall be adjacent to each control. Each 3" and larger discharge shall include an Akron Slo-Cloz adapter.

DISCHARGE ADAPTER:

The 3" discharge shall incorporate one (1) 3" NST LHF x 5" Storz 30 degree elbow with blind cap.

Each above valve shall be manually controlled.

3" DISCHARGE, APPARATUS REAR:

One (1) 3" discharge shall be located at the rear of the apparatus on the right side. The discharge shall be controlled from the pump operator's panel. The valve shall measure 3" and include an Akron 7830 with an Akron Slo-Cloz adapter.

One (1) Trident 01.054.20 3" FNST Swivel x 2½" MNST elbow with cap and chain shall be supplied for the 3" discharge.

Each above valve shall be manually controlled.

TANK TO PUMP LINE:

One (1) 3" tank to pump line shall be installed into the tank to the suction side of the pump. It shall have 4" piping and valved with a 3" full flow valve. The valve shall be controlled from the pump operator's panel. The tank line shall incorporate a check valve in the line to meet NFPA 1901.

	Bidder Complies	
	Yes	No

LINE DRAINS FOR DISCHARGES:

The drain valves shall be Innovative Controls ¾" 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 identifying each valve, also supplied by Innovative Controls. The color labels shall also include valve open and close verbiage.

GATED SUCTION, LEFT SIDE:

One (1) 2½" gated suction shall be located on the left side of the apparatus. It is to be piped 2½" i.d., including an Akron 2½" full flow quarter turn valve, and a 2½" NST female swivel with plug and chain. It is to be controlled from the suction location.

TANK FILL - 2½":

One (1) 2½" NH tank fill connection shall be located on the right side discharge panel of the apparatus. The assembly shall include a FirePrograms 3" Stainless Steel Fill Valve, Model 500061, three-inch inside diameter internal check valve with appropriately sized hose connection. The assembly shall also include a ¾" quarter turn line drain.

The FirePrograms 3" Fill Valve is an internally mounted check-type fill valve, capable of flowing at a rate up to 1,000 GPM. The Fill Valve is available in a 3" Victaulic connection or 3" male NPT pipe thread connection for ease of installation. The Fill Valve is self-deflecting, requiring no additional diffusion device. The Fill Valve is constructed of 100% stainless steel avoiding the use of dissimilar metals. The spring actuated piston-type sealing mechanism minimizes seal wear and provides positive sealing of the valve after shutting off the valve at the feed source. The device is designed to be self-cleaning utilizing a replaceable EPDM rubber gasket. Less than 6psi is required to open the valve.

Utilizing two stainless steel internal tank mounting plates, the 4-bolt Fill Valve mechanism is attached directly through the tank wall. The valve design is suitable for simple retrofit installation into existing water tanks.

SUCTION LINE DRAINS:

Each 2½" gated suction and those of larger sizes shall incorporate a ¾" quarter turn drain hosed to ground. The drain shall be located behind the body panel, remote controlled from the suction location.

FIXED MONITOR PIPING:

One (1) 3" discharge shall be located on the deck over the pump compartment. The discharge shall be flanged to adapt to a permanent mounted deck pipe. The piping shall be reinforced to allow rated deck pipe flow without piping distortion. The discharge valve shall be a quarter turn 3" full flow valve located in the pump compartment. It shall be controlled from the

	Bidder Complies	
	Yes	No

pump panel. The deluge and its control shall be positioned so the pump operator shall have complete control. The valve shall be a slow close valve per NFPA requirements.

Each above valve shall be manually controlled.

DECKMASTER ELECTRIC STYLE 3440:

The 1250 gpm rated monitor is to be an electric single waterway monitor with automated elevating capability, 3" 150 lb. flange inlet, 2.5" NH threaded outlet, cast-in turning vanes in each elbow, constructed of lightweight Pyrolite. The monitor shall have fully enclosed 12 or 24-volt motors and gears with manual override for horizontal, vertical, and elevation rotation. Each manual override will have a non-captive crank with a clip bracket on the monitor for storage. The monitor is not to exceed 17" high, 16¾" wide, and 17" deep in the stowed position. The center of the waterway will elevate to a height of 24" abvove the base of the flange. The outlet shall have a vertical rotation of 45º below horizontal to 90º above horizontal and 344º of horizontal rotation will be achievable. The logic box shall include coated, solid state components to resist water corrosion and include a set of DIP switches for built in options. Each control box shall control the vertical and horizontal position of the monitor, along with the pattern of the nozzle. The control box will have a toggle switch with guard to move the monitor into the stowed or deployed position. The control panel will have a light to indicate when the monitor is out of the stowed position with provisions for a second light in the vehicle cab.
The monitor shall be controlled at the pump operator's panel via a Panel Mount Control Box with Stow.

STYLE 5177 AKROMATIC 1250 ELECTRIC MASTER STREAM NOZZLE

One (1) Akron Brass Model 5177 Akromatic 1250 electric combination fog and straight stream master stream nozzle with automatic flow mechanism that provides a flow range of up to 1250 gpm at 80 psi shall be provided. The nozzle shall be constructed of durable, lightweight Pyrolite and shall have electric pattern selection from straight stream to wide fog controlled by a 12V motor and linear ball screw, a manual override pattern control knob, built-in stream shaper, and 2.5” NH swivel base.

WIRELESS REMOTE CONTROL:

The Akron Deckmaster monitor shall include a wireless remote control, in addition to the panel mount controller. The wireless remote control shall be capable of operating the monitor up to 500 feet away. The wireless remote control shall be a 7-button remote capable of stow and deployment of the monitor.

The deck gun finish shall remain as supplied by the manufacturer.

MONITOR RISER

The deck gun plumbing shall include one (1) Style 3406 Electric Riser. The riser is of three

	Bidder Complies	
	Yes	No

piece telescoping design to reduce required mounting space to an overall length of 17 ¼". The telescoping waterway shall be 3" diameter and constructed of hard anodized aluminum extrusion with grease fittings and positive stops. The riser will provide 12 inches of extension. The riser control systems will be able to connect to the Akron DeckMaster monitor 12 volt control system, so that it can be integrated into the stow/deploy function

CARTRIDGE LAY PRECONNECT MODULE - (2) 1½":

One (1) independent preconnect module shall be located ahead of the pump module, above the frame rails. The module shall be manufactured of stainless steel material, self supported, and shall incorporate two (2) preconnect hose beds.

Two (2) 1½" cartridge lay preconnects shall be located in the module. The preconnects shall incorporate a 1½", 180º Elkhart 348 swivel adapted to 1½" fire hose thread. The waterways shall be 2" i.d. and include a 2" full flow quarter turn ball valve that is controlled from the operator's panel (NFPA 4-7.2).

Each preconnect shall have the capacity to contain a minimum of 200 ft. of 1¾" hose with nozzle. The preconnects shall be designed as to allow the extension of hose to the left or right side of the apparatus body.

Each above valve shall be manually controlled.

Aluminum trays shall be incorporated with the system. Each tray shall be constructed of .1875" 5052 - aluminum sheet that is fabricated to accommodate the intended usage. Each cartridge shall be securely retained in the apparatus when in place. Aluminum abrasion plates shall be located on each side of the apparatus to protect body panels from the hose and its couplings during hose extension.

CARTRIDGE LAY PRECONNECT COVER - HYPALON:

The Cartridge Lay preconnect area shall be covered with a fire and chemically resistant material. It is to be retained to the apparatus with a slotted track retainer across top and heavy duty velcro on each side

The hypalon cover shall be red in color.

1½" PRECONNECT, BUMPER EXTENSION:

One (1) 1½" preconnect shall be incorporated within the bumper extension. The piping shall measure 2" i.d. and shall be valved with 2" full flow quarter turn ball valves that are controlled from the operator's panel. It shall include a bumper deck mounted 1½" Elkhart 348 swivel adapted to 1½" fire hose thread

Each above valve shall be manually controlled.

	Bidder Complies	
	Yes	No

BOOSTER REEL:

A Hannay Booster Reel, model EF4038-17-18RB, with electric rewind shall be installed in the rear compartment, mounted on the rear wall. A roller/ spool assembly, stainless steel roller, and chrome-plated spools shall be located within the compartment attached to the reel. The reel rewind switch shall be located on the exterior of the compartment.

The reel shall contain 100' of 1" red rubber booster hose coupled 1".

TANK FILL RECYCLE:

One (1) 2" waterway shall be incorporated from the pressure side of the pump to the tank. The line shall be controlled from the pump panel and valved with a 2" ball valve to allow a pump cooling recycle or tank fill when pumping from draft. When fully opened, it shall have the capacity to refill the tank at 750 gpm when pumping at 100 psi.

VALVING:

Each and every apparatus valve must be an Akron Stainless Steel Ball Valve, per the following specifications.

An Akron Brass Generation II Swing-Out™ Valve, shall be provided. The valve shall have an all brass body with flow optimizing stainless steel ball and dual polymer seats. The valve body shall be of universal design and accept multiple actuators. The valve 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. The stainless steel ball shall have HydroMax™ technology. All stainless steel parts must be 316 grade for increased resistance to corrosion. The valve shall not require lubrication of seats or any other internal waterway parts, and must be capable of swinging out of the waterway for maintenance by the removal of six bolts. The valve shall be compatible with a slow closing devise. This valve shall be actuated using a manual handle. The handle shall be quickly adjustable to one of eight handle positions and require only 90° travel. The valve shall be manufactured and assembled in the United States. Product must carry a 10 year manufacturer's warranty.

PIPING:

All waterways described herein shall be of schedule 40 threaded stainless steel pipe, schedule 10 welded stainless steel, or "aeroquip" hose. Each shall be installed with the proper couplings to allow apparatus twisting, flexing, and complete removal for service or replacement.

PIPING CERTIFICATION:

Upon final apparatus delivery, a certification sheet shall accompany the unit stating that all piping and the pump have been hydrostatically tested to 250 psi.

	Bidder Complies	
	Yes	No

BODY:

BODY:

FRONT BODY PANEL:

The front of the body is manufactured of 14 gauge 304 #4 finish stainless steel for ease of maintenance and protection of the lower body area.

REAR BODY PANEL:

The rear center of the body shall be smooth 14 gauge 304 #4 finish stainless steel material, in preparation for Chevron striping.

WHEEL HOUSING, SMOOTH STAINLESS STEEL:

The rear wheel housing and center door posts shall be constructed of 12 gauge 304 stainless steel with a #4 finish and shall incorporate a polished stainless steel fenderette. The circular interliner shall be manufactured of 3/16" Tivar 1000 polymer material. The wheel well shall be a bolt-in wheel well assembly for ease of maintance in the apparatus.

The polymer material is a chemical and corrosion resistant material, thereby preventing excess wear and corrosion from occurring due to wintertime road chemicals. The polymer material shall be held in place by the use of polymer retainers or bolts for ease of repair and access to the wheel well area.

The wheel well housing and upper center door post finish shall remain natural stainless steel # 4 finish

BODY SUB FRAME – STAINLESS STEEL:

The body sub frame system shall be designed for the emergency service application. The sub frame shall be independent of the chassis frame and is to be constructed of heavy structural material to provide the maximum strength and body support necessary for units utilized in emergency service. The system not only is used for total support designed to carry the total load of the apparatus; the system also allows the unit to be a complete lift off transferable apparatus once completed.

The system is designed to carry the emergency apparatus on the chassis main frame in a European style method. This method allows the apparatus body to float independently from the chassis frame ahead of the rear wheels and shall be rigidly attached behind the rear axle area.

	Bidder Complies	
	Yes	No

The sub frame system shall be isolated from the chassis frame with a custom full length rubber extrusion that totally locks onto each chassis frame rail. This system isolates the body from the frame while also acting as a cushion between the two units.

The sub frame system shall be manufactured completely of 304L stainless steel material. The stainless steel sub frame shall incorporate 6 x 3 x .375 304L stainless steel angle which shall run the full length of each chassis frame rail from the back of the cab to the end of the frame. The angle provides heavy duty stability to each outrigger installed on the unit. The system is designed to keep the outriggers from deflecting once the unit is loaded.

Each outrigger shall consist of a 4 x 2 x 7 gauge 304L stainless steel rectangular tubing vertical downrigger to continue the total sub frame support. Each horizontal under compartment outrigger shall be manufactured of a custom 7 gauge 304L stainless material which is formed in a channel design for maximum support. The horizontal outriggers shall include a minimum of two (2) custom designed **VibraCenters** installed on each outrigger to support the load of the body. This system also supports the compartment load and allows it to absorb the road energy and prevent premature wear of the customer's equipment which is loaded in the apparatus. Each **VibraCenter** is designed to carry the load of the apparatus per NFPA guidelines and to absorb shock loads in excess of 10 g's.

The tank cradle shall be incorporated within the sub frame system to allow for a lower vertical center of gravity and to allow the water load weight to be supported by the sub frame system. The tank cradle shall incorporate the heavy sub frame and 7 gauge 304L stainless steel channel placed in accordance with the poly tank manufacturer's recommendations. Each channel is reflex coated to prevent the water tank from chaffing with the stainless steel sub frame.

The stainless steel subframe shall be manufactured utilizing 3/8" Magna-Grip LockBolt fasteners. The fasteners are widely known as the most reliable wide grip fastening system available and also provide vibration and loosening resistance.

TAILSTEP:

The tailstep shall be constructed of 12 gauge star punched stainless steel material. The material meets NFPA standard 13-7.3: all exterior surfaces have a minimum slip resistance of .68.

GRAB HANDLES:

One (1) 36" knurled bright stainless steel 1¼" O.D. grab rail shall be installed vertically on the rear of the apparatus on the right side.

REAR TOW EYES:

Two (2) ¾" thick steel tow eyes shall be securely fastened to the rear frame rails, one (1) on each side below the body at the rear. Each tow eye shall be manufactured of the same

	Bidder Complies	
	Yes	No

material as the body subframe

DUAL BOTTLE AIR BOTTLE COMPARTMENT(S):

Three (3) Model 101400-1X air bottle storage compartment(s) shall be located in the apparatus wheel well assemblies. For ease of access, each bottle shall be stored within an individual storage tube manufactured of poly material. The compartment shall incorporate a vertically hinged stainless steel door with a black push button latch. Each compartment shall have the capacity to carry two (2) air bottles.

LOCATION: Install one (1) on left side in forward wheel well position and two (2) on right side with one (1) in forward and one (1) in rearward wheel well positions.

HOSE BED:

The hose bed shall be located over the booster tank, and must be accessible from the tail step and from its open top. The hosebed shall be incorporated with the booster tank and shall be manufactured of poly material. The hose bed compartment shall have a minimum capacity of 55 cu. ft. and a minimum width of 63". The rear corners of the hose bed side walls shall be tapered for improved access.

HOSEBED FLOOR:

The floor of the hosebed shall incorporate a channel system for improved air flow and to aid in the drainage of accumulated moisture on the floor, NO EXCEPTIONS.

LIGHT BOXES:

The side wall of the hosebed on each side shall incorporate light boxes for mounting of rear upper warning lights and rear/side scene lights. The light boxes shall be built-in, manufactured of the same material as the hosebed and tank, and paint to match the apparatus body, NO EXCEPTIONS.

The hosebed shall have the capacity to carry the following hose:

1000' of 5" hose
500' of 3" hose
200' of 2.5" hose
200' of 1.75" hose

The side panels of the hose bed shall be painted to match the lower cab color.

HOSE BED PANEL LETTERING:

The right and left sides of the apparatus hose bed will be lettered with vinyl lettering as described below. Each letter shall be 5"- 6" high and hand applied.

	Bidder Complies	
	Yes	No

The lettering vinyl style shall be simulated gold dust.

The lettering font style shall be Eurostile Bold.

The lettering font highlight type shall be shadow.

HOSE BED DIVIDERS:

Three (3) dividers shall be located in the hose bed. They shall be constructed of 3/16" aluminum plate. The dividers shall be designed for future adjustability with locking blocks in aluminum channels at the front and the rear of the hose bed.

HOSE BED COVER:

One (1) custom tailored hypalon hose bed cover shall be included with the apparatus body. It shall be manufactured of a flame retardent material with a grab tensile of 480 x 500 lbs. and a tonge tear of 160 x 150 lbs. It shall be crack resistant to -40º Fahrenheit and have an adhesion lbs./in of 10.0 lbs. The hose bed cover shall be fitted to the hose bed and retained with a double woven shock cord on the front and both sides. The shock cord shall system shall utilize nylon hooks spaced every 10"-12". The cover shall be sand weighted across the rear flap and shall also include two (2) 2" wide nylon straps with teflon buckle to meet NFPA requirements.

The hosebed cover shall include a 3 year warranty.

The hypalon cover shall be red in color.

COMPARTMENTATION:

COMPARTMENT DESIGN:

The compartmentation shall be fabricated of bolted 14 gauge 304 stainless steel walls and 12 gauge 304 stainless steel floors. The compartmentation is designed to be an intricate part of the body and subframe for maximum compartment support. The compartment tops shall be fabricated of smooth stainless steel material and shall meet the intent of the latest edition of NFPA 15.7 regarding stepping, standing, and walking surfaces. The material shall be formed over each compartment top to act as drip protection over each compartment opening. The compartment flooring will be sweep out design. The front and rear corners of the body shall remain natural finish #4 stainless steel. The material be full height and shall wrap around each corner to the compartment door frame.

The specified lighting in each compartment shall be switched automatically with the doors. The lighting shall meet the requirements of NFPA 13.10.5

PAINTED ROLL-UP DOORS:

	Bidder Complies	
	Yes	No

The side compartments shall have ROM Series IV Roll-up Shutter Doors with a **painted** finish. The doors shall be made of an anodized aluminum slat incorporating an exclusive seal that prohibits water intrusion, absorbs shock, eliminates clatter, and provides quiet, vibration-free performance. The lift bar shall be a D-shaped bar for strength and ease of use.

The rear compartment shall have ROM Series IV Roll-up Shutter Door with a **satin** finish. The door shall be made of an anodized aluminum slat incorporating an exclusive seal that prohibits water intrusion, absorbs shock, eliminates clatter, and provides quiet, vibration-free performance. The lift bar shall be a D-shaped bar for strength and ease of use.

DOOR GUARD:

There shall be a .125" aluminum treadplate door guard located at the top of the compartment to protect the painted surface of the ROM door from damage while the door is open. The door opening height as stated will be reduced by approximately 2" to accommodate the door gaurd.

TALL BOTTOM RAIL:

Each ROM door shall incorporate a tall bottom rail for improved accessibility.

ROLL UP DOOR PULL STRAPS:

Each roll up door shall incorporate a ROM elastic pull strap to assist in closing the door.

The roll-up door side tracks and top drip rail shall remain **satin** finish.

COMPARTMENT VENTS:

One (1) interior vent shall be installed in each compartment. The vent shall be constructed of stainless steel and shall incorporate four (4) 5" x ¾" louvers.

LEFT SIDE BODY SHALL BE AS FOLLOWS:

L1

A roll-up door compartment assembly with a door opening of 61" wide x 62" high x 25" deep shall be incorporated on the apparatus left side ahead of the rear wheels.

The compartment shall include the following:

One (1) vertical compartment divider separating the pumping system from the balance of the compartment.

Unistrut Tracking

	Bidder Complies	
	Yes	No

One (1) adjustable vertical pull out board(s).

One (1) shoe box shall be mounted to the base of each above tool board for large item storage

One (1) additional adjustable vertical pull out board

One (1) shoe box shall be mounted to the base of each above tool board for large item storage

E45 Series LED strip lights to illuminate the entire area. The lights shall run the entire height of the compartment on each side of the door opening.

L2

One (1) compartment with a roll-up door shall be located above the wheel well on the left side. It shall have a door opening of 63" wide x 30" high x 25" deep.

The compartment shall include the following:

Unistrut Tracking

One (1) up to 26” deep Roll Out Drop Down Tray(s)

Each above roll out tray shall be stationary.

One (1) additional up to 26” deep Roll Out Drop Down Tray(s)

Each above roll out tray shall be stationary.

E45 Series LED strip lights to illuminate the entire area. The lights shall run the entire height of the compartment on each side of the door opening.

L3

A roll-up door compartment assembly with a door opening of 52" wide x 62" high x 25" deep shall be incorporated on the apparatus left side behind the rear wheels.

The lower area shall be transverse with the R3 compartment.

The compartment shall include the following:

Unistrut Tracking

One (1) adjustable vertical pull out board(s).

One (1) additional adjustable vertical pull out board

	Bidder Complies	
	Yes	No

One (1) additional adjustable vertical pull out board

One (1) shoe box shall be mounted to the base of each above tool board for large item storage

E45 Series LED strip lights to illuminate the entire area. The lights shall run the entire height of the compartment on each side of the door opening.

RIGHT SIDE BODY SHALL BE AS FOLLOWS:

R1

A roll-up door compartment assembly with a door opening of 61" wide x 62" high x 25" deep shall be incorporated on the apparatus right side ahead of the rear wheels.

The compartment shall include the following:

One (1) vertical compartment divider separating the pumping system from the balance of the compartment.

Unistrut Tracking

One (1) full depth adjustable shelf (ves)

One (1) up to 26” Deep 250 # Roll Out Tray(s)

Each above roll out tray shall be stationary.

One (1) up to 26” deep Roll Out Drop Down Tray(s)

Each above roll out tray shall be stationary.

E45 Series LED strip lights to illuminate the entire area. The lights shall run the entire height of the compartment on each side of the door opening.

R2

One (1) compartment with a roll-up door shall be located above the wheel well on the right side. It shall have a door opening of 63" wide x 30" high x 25" deep.

The compartment shall include the following:

Unistrut Tracking

One (1) up to 26” deep Roll Out Drop Down Tray(s)

	Bidder Complies	
	Yes	No

Each above roll out tray shall be stationary.

One (1) additional up to 26” deep Roll Out Drop Down Tray(s)

Each above roll out tray shall be stationary.

E45 Series LED strip lights to illuminate the entire area. The lights shall run the entire height of the compartment on each side of the door opening.

R3

A roll-up door compartment assembly with a door opening of 52" wide x 62" high x 25" deep shall be incorporated on the apparatus right side behind the rear wheels.

The lower area shall be transverse with the L3 compartment.

The compartment shall include the following:

Unistrut Tracking

One (1) full depth adjustable shelf (ves)

One (1) full depth adjustable shelf (ves)

One (1) up to 26” Deep 250 # Roll Out Tray(s)

Each above roll out tray shall be stationary.

E45 Series LED strip lights to illuminate the entire area. The lights shall run the entire height of the compartment on each side of the door opening.

REAR COMPARTMENT SHALL BE AS FOLLOWS:

A roll-up compartment assembly with a door opening of 41" wide x 61" high x 30" deep shall be located at the rear of the apparatus.

TRANSVERSE OPENING:

The side compartments behind the wheel shall be made transverse or interconnecting with the rear compartment. This transverse compartment will be full body width and must be accessible from the left side, right side or the rear compartment area.

The rear compartment shall include the following:

One (1) 500 # Roll Out Tray(s)

	Bidder Complies	
	Yes	No

E45 Series LED strip lights to illuminate the entire area. The lights shall run the entire height of the compartment on each side of the door opening.

LADDER AND SUCTION HOSE STORAGE:

The ladders and suction hose shall be stored in a compartment located through the booster tank. The compartment shall be manufactured of poly material and shall be accessible from the rear compartment of the apparatus through the rear roll up door.

The ladder and suction hose storage shall have the capacity to contain the following: One (1) 24' 2-section ladder, one (1) 14' Roof Ladder with hooks, one (1) 10' attic ladder, two (2) up to 12' lengths of hard suction hose and two (2) pike poles.

RUB RAILS:

Bolt on aluminum rub rails shall be installed, below the compartment doors. Said rub rails will be fabricated of a polished "C" channel aluminum, mounted to the body surface utilizing ¼" plastic spacers. The channel designed rub rail shall incorporate a highly reflective red and fluorescent yellow green reflective stripe to aid in apparatus protection.

The rub rails shall incorporate the LED ground lights and LED lower warning lights. Each light strip shall run the full length of each rub rail.

STAINLESS STEEL TOP ACCESS LADDER:

One (1) Sure-Grip Stainless steel access ladder shall be provided at the rear of the apparatus on the left side. Sure-Grip is a collapsible, self-retracting ladder that provides safety and security while ascending or descending. The ladder stores in a low profile position parallel to the truck body. To use, the bottom section simply flips down and the ladder pulls out to a comfortable climbing angle. When finished, the bottom section flips up and locks in place.

The Sure-Grip Ladder is constructed of stainless steel and uses stainless hardware to provide dependable use in all environments. The standard ladder is provided with a # 4 finish. Aluminum non-skid surface steps provide traction and safety in any condition. Sure-Grip Ladder is designed to meet all NFPA standards.

The access ladder shall incorporate 36" knurled stainless steel grab handles, one (1) each side.

VERTICAL UNISTRUT IN COMPARTMENT:

The unistrut tracking as previously specified shall be vertically installed on the compartment walls of for use with adjustable shelving. The tracking will allow the shelving to be adjustable to height with an eight (8) bolt lock. The tracking shall be installed from the floor of the compartment to approximately 4" below the ceiling of the compartment, allowing full height adjustability.

	Bidder Complies	
	Yes	No

TANK:

BOOSTER TANK:

The tank shall have a capacity of 1000 US gallons complete with a lifetime warranty. The tank manufacturer shall mark the tank and furnish notice that indicates proof of warranty. The purpose of the markings and notice is to inform department personnel who store, stock, or use the tank that the unit is under warranty. Markings may be brief but should include a short statement that a warranty exists, the substance of the warranty, its duration, and who to notify if the tank is found to be defective.

The tank shall be constructed of ½" thick PT2E polypropylene sheet stock. This material shall be non- corrosive stress relieved thermo-plastic and U.V. stabilized for maximum protection.

The booster tank shall be of a specific configuration and so designed to be completely independent of the body and compartments. All joints and seams shall be nitrogen welded and tested for maximum strength and integrity. The transverse swash partitions shall be manufactured of 3/8" PT2E polypropylene (natural in color) and extend from approximately 4" off the floor to just under the cover. The longitudinal swash partitions shall be constructed of 3/8" PT2E polypropylene (natural in color) and extend from the floor of the tank through the cover to allow for positive welding and maximum integrity. 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 welded to each other as well as to the walls of the tank.

FILL TOWER AND COVER

The tank will have a combination vent and manual fill tower. The fill tower will be constructed of ½" PT2E polypropylene and shall be a minimum dimension of 8" x 8" outer perimeter. The tower will be located in the left front corner of the tank. The tower will have a ¼" thick removable polypropylene screen and a PT2E polypropylene hinged type cover. Inside the fill tower, approximately 4" down from the top, shall be fastened a combination vent overflow pipe. The vent overflow shall be a minimum of schedule 40 polypropylene pipe with a minimum I.D. of 4" that is designed to run through the tank and shall be piped behind the rear wheels.

The tank cover is constructed of ½" thick PT2E polypropylene and UV stabilized, to incorporate a multi three-piece design which allows for individual removal and inspection if necessary. The tank cover will be recessed 3/8" from the top of the tank and shall be welded to both sides and longitudinal partitions for maximum integrity. Each one of the three covers will have hold-downs consisting of 2" polypropylene dowels spaced a maximum of 30" apart. These dowels will extend through the covers and be welded to the transverse partitions. This will assist in keeping the cover rigid under fast filling conditions. A minimum of two (2) lifting dowels shall be drilled and tapped ½" x 13" to accommodate the lifting eyes.

	Bidder Complies	
	Yes	No

SUMP

There will be one (1) sump standard per tank. The sump shall be constructed of ½" PT2E polypropylene and be located in the left front quarter of the tank. The sump will have a minimum 3" NPT threaded outlet on the bottom for a drain plug. This shall be used as a combination cleanout and drain. All tanks shall have an anti-swirl plate located approximately 2" above the sump.

OUTLETS

There will be two (2) standard tank outlets: one for the tank to pump suction line which will be a minimum of a 3" NPT coupling and one for a tank fill line which will be a minimum of a 2" NPT coupling. All tank fill couplings will be backed with flow deflectors to break up the stream of water entering the tank, and be capable of withstanding sustained fill rates of up to 1000 GPM. All auxiliary outlets and inlets must meet all NFPA guidelines in effect at the time of manufacture.

MOUNTING

The UPF Poly Tank IIE shall rest on the body cross members with an unsupported area not to exceed 530 sq. inches on tanks up to 40" in height. On tanks over 40" in height, an unsupported area of not more than 400 sq. inches must be maintained. All tanks shall be isolated from the cross members through the use of hard rubber strips with, a minimum thickness and width dimension of .250 x 2" and a minimum Rockwell hardness of 60 durometer. Additionally, the tank must be supported around the entire bottom outside perimeter and captured both front and rear as well as side to side to prevent the tank from shifting during vehicle operation. A picture frame type cradle mount shall be utilized with a minimum of 2" x 2" x .250 structural material.

Although the tank is designed on the free-floating suspension principle, it shall be required that the tank have hold down restraints half way between the front and the rear of the tank. These restraints shall be made of 3" x 3" x ¼" angle approximately 6" long. The restraints shall be mounted to the side walls of the hose bed and extend down so that they rest approximately ½" above the top of the tank. The tank shall be completely removable without disturbing or dismantling the apparatus structure.

Upon final apparatus delivery, proper evidence and certifications shall be presented indicating the tank has the capacity of flow to the pump 80% of its rated capacity at a flow rate of 1000 GPM.

12 VOLT ELECTRICAL:

12 VOLT ELECTRICAL SYSTEM:

Our electrical system is engineered to provide many years of dependable, trouble free service.

	Bidder Complies	
	Yes	No

The 12 volt apparatus wiring shall be completely independent of the chassis electrical system. The system shall incorporate a state-of-the-art electrical distribution center. The center shall include a microprocessor, automatic reset circuit breakers, and switching relays.

The microprocessors are housed in a weather resistant enclosure. All processors are fully tested, and modern production processes guarantee long-term reliability in the most rigorous environments. The microprocessors handle the numerous switching functions without the excessive use of relays and the need for excess wiring.

The system can be expanded by adding additional processors and required components to meet desired specifications.

The weather tight modular service center shall be placed in a water-tight compartment in the apparatus body. The service center housing shall be manufactured of aluminum and shall incorporate an access door. Since the microprocessor is of weather resistant design and enclosed in the service center, the electrical system has redundant protection against moisture and corrosion. Redundant protection from the elements dramatically improves reliability and durability.

Wiring harnesses shall be custom made for each truck. Each harness shall be encased in a split barrel, nylon type loom which will be moisture resistant and flame resistant to a minimum of 280º F. Loop outs shall be made at the harness factory utilizing sealed sonic weld technology instead of open-ended butt splicing. The harnesses shall feature Deutsch heavy duty all metal connectors.

Unlike terminal strips, binding post and other open-wiring systems, the Deutsch HD series is a completely sealed unit. The elimination of open wiring systems does away with contamination from moisture, dust, lubricating oils, road salt, and other environmental hazards encountered in heavy duty use. The connector shall provide a multiple keying system that positively prevents mis-mating and makes plug/receptacle coupling quick and easy. The modular harness system will allow for quick and efficient complete body transfer if needed.

An independent switching station shall be centrally located in the apparatus cab. The switches shall be of a rocker type illuminating design. Each switch shall be color coded , and include a description indicating its intended use. Each switch shall be removable for service and replacement. Each switch shall be rated at 10 amp at 250 volts AC and shall act as inputs for the microprocessor.

All electrical circuit feeder wiring supplied and installed by the apparatus manufacturer shall be stranded copper alloy conductors of a gauge rated to carry 125% of the maximum current for which the circuit if protected. Insulation shall be in accordance with SAE J1128, low tension primary cable, type SXL or GXL, and wired to SAE J1292, automobile, truck, truck-tractor, trailer and motor coach wiring, for such loading at the potential employed. Voltage drops in all wiring from the power source to the using device shall not exceed 10%. Overall covering of conductors shall be 280º F (143º C) minimum flame retardant, moisture resistant loom or braid. All connections shall be made with lugs or terminals mechanically secured to

	Bidder Complies	
	Yes	No

the conductors. Wiring shall be thoroughly secured in place and suitably protected against heat, oil, and physical damage. Wiring shall be color coded and printed with a circuit function code over each conductor's entire length.

Circuits shall be provided with properly rated low voltage over-current protective devices. Such devices shall be readily accessible and protected against excessive heat, physical damage and water spray, switches relays, terminals, and connectors shall have a direct current rating of 125% of maximum current for which the circuit is protected.

Wiring Diagrams: Two (2) destination effective wiring diagrams shall be furnished with the apparatus. The wiring diagrams shall incorporate notations to assist an individual with limited electrical experience in the service of the apparatus electrical system.

NOTE: All wiring and components shall meet or exceed current N.F.P.A. codes.

LOAD MANAGEMENT:

The 12 volt load management functions shall be incorporated within the microprocessor based 12 Volt electrical system without the need for a separate load manager.

ELECTRICAL SYSTEM PERFORMANCE TESTS:

The apparatus low voltage electrical system shall be tested and certified per the current NFPA standard. The certification shall be delivered to the purchaser with the apparatus.

DOCUMENTATION:

At the time of delivery, the manufacturer shall provide the following:

(a) Documentation of the electrical system performance tests;
(b) A written load analysis, including:

1. The nameplate rating of the alternator;
2. The alternator rating;
3. Each component load comprising the minimum continuous load;
4. Additional loads that, when added to the minimum continuous load, determine the total connected load;
5. Each individual intermittent load.

RADIO:

One (1) radio(s) shall be installed by the customer after receipt of the completed apparatus.

TIRE PRESSURE MONITORING DEVICE:

	Bidder Complies	
	Yes	No

One (1) set of Real Wheels LED Air Guard tire pressure indicators shall be shipped loose with the completed apparatus. Features and benefits of the LED Air Guards include

- Safety – Improper tire pressure has a detrimental effect on handling, braking and control.
- Longer Tire Life – According to the D.O.T., 95% of all premature tire wear is caused by underinflation.
- Self-calibrating – LED AirGuard Set & Go memorizes pressure when initially installed and can be easily recalibrated by simply removing and reinstalling.
- Improved Fuel Economy – Proper tire inflation can save an estimated 3% to 5% in fuel costs.

OPTICAL WARNING SYSTEM:

The optical warning system on the fire apparatus 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.

EMERGENCY WARNING LIGHTS:

For the purpose of defining and measuring the required optical performance, the apparatus shall be divided into four warning zones. The four zones shall be determined by drawing lines through the geometric center of the apparatus at 45º to a line lengthwise of the apparatus through the geometric center. The four zones shall be designated A, B, C, and D in a clockwise direction with zone A to the front of the apparatus. Each zone shall have an upper and lower warning level.

Effective coverage of all four zones, both upper and lower, as required by the latest NFPA Edition shall be provided.

LIGHTBAR:

The lightbar shall be supplied on the chassis by the chassis manufacturer.

FRONT WARNING LIGHTS:

The front warning lights shall be supplied on the chassis by the chassis manufacturer.

WARNING LIGHTS (SIDE):

The rub rails on each side of the body shall incorporate integral outward facing Red LED strip lights. In addition to the Red LED strip light, the rub rail on each side ahead of the rear wheels shall incorporate one (1) Whelen Model MCRNTRR Red Micron LED light. These lights shall be switched from the in cab switch panel.

	Bidder Complies	
	Yes	No

WARNING LIGHTS (SIDE):

Two (2) Whelen Model 90RR5FRR Red Super Linear LED lights shall be mounted on the right (officer's) side of the vehicle, in the upper area. These lights shall be switched from the in cab switch panel.

Two (2) Whelen Model 90RR5FRR Red Super Linear LED lights shall be mounted on the left (driver's) side of the vehicle, in the upper area. These lights shall be switched from the in cab switch panel.

These lights fill the requirements of Zones B & D Upper.

Each light shall be mounted utilizing a chrome plated flange.

WARNING LIGHTS (REAR UPPER):

Two (2) Whelen Model 90RR5FRR Red Super Linear LED lights shall be mounted on the rear of the vehicle, in the upper area. The lights shall be switched from the in cab switch panel. These lights fill the requirements of Zone C Upper.

Each light shall be mounted utilizing a chrome plated flange.

WARNING LIGHTS (REAR):

Two (2) Whelen Model 60R02FRR red Super Linear LED lights shall be mounted on the lower rear area of the vehicle. These lights shall be switched from the in cab switch panel. These lights fill the requirements of Zone C Lower.

Each light shall be mounted utilizing a chrome plated flange.

REAR DRIVING SIGNALS:

The rear driving signals shall consist of two (2) Code 3 7X9STTRBZ LED lights, one (1) each side of the apparatus at the rear. The 7X9 LED lights shall incorporate red brake/tail, amber turn, and white backup in a single light head. The mounting shall include a chome bezel.

ARROW STIK:

One (1) Whelen Model TAL65 LED traffic advisor (arrow stik) shall be mounted under the intermediate rear step. The unit shall be controlled from the in cab switching station.

TURN SIGNALS-MIDSHIP:

One (1) S34 Series amber LED midship turn light shall be mounted on each side of the apparatus ahead of the rear wheels.

	Bidder Complies	
	Yes	No

ICC LIGHTING:

S34 Series LED Clearance lights shall be installed on the apparatus. They shall be hermetically sealed cartridge lights for ease of service and durability.

REAR LICENSE PLATE BRACKET:

There shall be a lighted license plate bracket mounted on the rear of the vehicle. The light shall be a L11 Series LED light.

PUMP COMPARTMENT LIGHT:

One (1) 5" 12-volt T41 Series LED light shall be installed in the pump compartment. The light shall be switched with pump panel lights.

HAZARD LIGHT:

A red, LED flashing light located in the driving compartment 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, or 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".

LED COURTESY LIGHTS (UNDER CARRIAGE LIGHTING):

A 5" 12-volt T41 Series LED light shall be located under each cab door. All ground area lighting shall be controlled by the master switch and shall be switched with the parking brake.

In addition to the 5" lights, clear LED strip lights shall be provided integral to the rub rails on each side. The strip lights shall face downward and be activated with the balance of the undercarriage lighting.

FIRETECH 12-VOLT LED SCENE LIGHT(S):

Two (2) FireTech FT-MB-2.36-FT-* 40" Double Stack 38,016 lumen LED bar scene light(s) shall be mounted in the specified location(s). The lights shall be switched from the in-cab switching station.

Each Firetech Hi-Viz scene light shall be black in color.

LOCATION: Two (2) Each Side

FIRETECH 12-VOLT LED SCENE LIGHT(S):

	Bidder Complies	
	Yes	No

Two (2) FireTech FT-MB-2.6-FT-* 8" 6,336 lumen LED bar scene light(s) shall be mounted in the specified location(s). The lights shall be switched from the in-cab switching station.

Each Firetech Hi-Viz scene light shall be black in color.

LOCATION: Rear

TELESCOPIC LED FLOODLIGHT

Two (2) Fire Research Spectra LED Scene Light model SPA530-Q20 side mount push up telescopic light shall be installed. The light pole shall be anodized aluminum and have a knurled twist lock mechanism to secure the extension pole in position. The extension pole shall rotate 360 degrees. The outer pole shall be a grooved aluminum extrusion and qualify as an NFPA compliant handrail. The pole mounting brackets shall have a 2 3/4" offset. Wiring shall extend from the pole bottom with a 4' retractile cord.

The lamphead shall have eighty four (84) ultra-bright white LEDs, 72 for flood lighting and 12 to provide a spot light beam pattern. It shall operate at 12/24 volts DC, draw 18/9 amps, and generate 20,000 lumens of light. The lamphead shall have a unique lens that directs flood lighting onto the work area and focuses the spot light beam into the distance. The lamphead angle of elevation shall be adjustable at a pivot in the mounting arm and the position locked with a round knurled locking knob. The lamphead shall be no more than 5 7/8" high by 14" wide by 3 1/2" deep and have a heat resistant handle. The lamphead and mounting arm shall be powder coated. The LED scene light shall be for fire service use.

ON / OFF SWITCH FOR FOCUS LAMPHEAD

Fire Research Focus –ON option switch shall be installed on the Focus lamphead. The weatherproof on-off toggle switch shall be mounted in a switchbox below the lamphead. The switchbox shall be powder coated white.

LOCATION: One (1) side at the front of the body

HOSEBED BULKHEAD LIGHTING - LED:

Three (3) 5" LED 12-volt lights, T44 Series, shall be located in the front bulkhead of the apparatus hose bed, below the body decking. Each light shall be rubber grommet mounted and shall be recessed in the upper front wall. Each light shall be switched with the parking brake.

CHASSIS SUPPLIED CAMERA INSTALLATION:

Three (3) chassis supplied 360 cameras shall be installed one (1) each side and one (1) at the rear.

	Bidder Complies	
	Yes	No

********120 VOLT ELECTRICAL SYSTEM********

GENERATOR - HYDRAULICALLY DRIVEN:

One (1) Smart Power, model HR-8, 8000 watt hydraulic generator shall be provided. The generator is designed specifically for mounting on top of the vehicle, at the customer-specified location, but can also be easily separated into its three major components (tray, cooler/fan assembly, and reservoir) for mounting in custom applications.

The generator system shall come with a standard 5 year/1,000 hour fully transferable warranty from the manufacturer.

The unit shall come equipped with: generator tray assembly (which includes the generator, hydraulic motor, cooler, fan, electronics package, 10 micron spin-on fluid filter and reservoir), axial piston hydraulic pump with pressure compensated control, and Command and Control Center (CCC) display with all required wiring harnesses. The CCC shall be an interactive operator control center, equipped with smart touch solid state buttons, with displays for voltage, frequency, amperage, hour meter, service reminders, operator warnings, system faults and diagnostics. Standard electronics package shall include smart start engagement to reduce mechanical stress, precise voltage and frequency control, cold start system, automatic load and temperature compensation, integrated diagnostics system, and other automated control features to protect system, vehicle and operator.

The generator tray assembly shall be delivered with the cooler/fan assembly mounted such that the hot air is exhausted straight up, through an NFPA approved walking grate.

The body of the generator tray assembly (including reservoir) shall be 32" long x 13.5" wide x 17" high, weighing approximately 185 pounds. The hydraulic pump shall be driven by a chassis transmission mounted power take off (PTO).

Ratings and Capacity

Rating:	9000 watts peak 8000 watts continuous
Volts:	120/240 volts
Phase:	Single, 4 wire
Frequency:	60 Hz
Amperage:	66 amps @ 120 volts or 33 amps @ 240 volts
Engine speed at engagement:	Standard soft start feature allows for any speed engagement
Operation range:	880 to 3120 RPM

Testing

The generator shall be tested in accordance with all current N.F.P.A. 1901 standards.

Notes

	Bidder Complies	
	Yes	No

*All ratings and capacities shall be derived utilizing current NFPA 1901 test parameters.

REMOTE GENERATOR SHIFT

The generator shall be driven from the PTO opening of the automatic transmission through a hot shift PTO. The PTO activation shall be automatically engaged after engine oil pressure is stabilized. An emergency PTO shut down switch will be provided on the cab switch panel. The generator output shall be engaged electrically from the cab and the pump panel, (or an auxiliary rescue control panel.) A light shall be positioned to indicate when generator is activated.

120 VOLT ELECTRICAL SYSTEM:

The complete wiring and electrical installation shall conform to the present National Electrical Code standards of the National Fire Protection Association. The system shall be installed by highly qualified electrical technicians to assure the required level of safety and protection to the fire apparatus operators.

The wiring, electrical fixtures and components shall conform to the highest industry quality standards available on the domestic market. The equipment shall be the type designed for mobile-type installations subject to vibration, moisture and severe continuous usage.

The electrical wiring shall be 12 ga. copper stranded type installed through 'liquidtite' flexible moisture resistant reinforced conduit, with proper seal-tight connectors and hardware. The use of armour cable, light wall E.M.T. or Romex shall not be acceptable.

LINE VOLTAGE ELECTRICAL SYSTEMS:

The maximum voltage between a conductor and any other conductor or an earth ground shall not exceed 250 volts +/- 10 percent.

Any fixed line voltage power source producing alternating current (AC) line voltage shall produce electric power at 60 cycles +/- 5 cycles.

Except where superseded by the requirements of this chapter, all components, equipment, and installation procedures shall conform to NFPA 70, National Electrical Code (herein referred to as the NEC). Where the requirements of this chapter differ from those in the NEC, the requirements in this chapter shall apply.

Line voltage electrical system equipment and materials included on the apparatus shall be listed and installed in accordance with the manufacturer's instructions. All products shall be used only in the manner for which they have been listed.

LOCATION RATINGS:

Any equipment used in a dry location shall be listed for dry locations. Any equipment used

	Bidder Complies	
	Yes	No

in a wet location shall be listed for wet locations.

Any equipment used in an underbody or under-chassis location that is subject to road spray shall be either listed as Type 4 or mounted in an enclosure that is listed as Type 4.

GROUNDING AND BONDING

GROUNDING:

Grounding shall be in accordance with Section 250-6 (Portable and Vehicle Mounted Generators) of the NEC. Ungrounded systems shall not be used. Only stranded or braided copper conductors shall be used for grounding and bonding. An equipment grounding means shall be provided in accordance with Section 250-91 (Grounding Conductor Material) of the NEC.

The grounded current carrying conductor (neutral) shall be insulated from the equipment enclosures and other grounded parts. The neutral conductor shall be colored white or gray in accordance with Section 200-6 (Means of Identifying Grounding Conductors) of NEC.

Any bonding screws, straps, or buses in the distribution panel board or in other system components between the neutral and equipment grounding conductor shall be removed and discarded.

BONDING:

The neutral conductor of the power source shall be bonded to the vehicle frame. The neutral bonding connection shall only occur at the power source.

In addition to the bonding required for the low voltage return current, each body and driving or crew compartment enclosure shall be bonded to the vehicle frame by a copper conductor. This conductor shall have a minimum amperage rating of 115% of the nameplate current rating of the power source specification label as defined in Section 310-15 (Ampacities) of the NEC. A single conductor, properly sized to meet the low voltage and line voltage requirements shall be permitted.

POWER SOURCE GENERAL REQUIREMENTS:

The following requirements shall apply to all line voltage power sources.

All power source system mechanical and electrical components shall be sized to support the continuous duty nameplate rating of the power source.

The power source shall be shielded from contamination that will prevent the power source from operating within its design specifications.

Guards shall be provided to protect personnel from moving parts and any surface with a

	Bidder Complies	
	Yes	No

temperature of 131º F or more.

The power source shall have adequate ventilation to prevent heating of the system above the manufacturer's recommended limits.

Access shall be provided to permit both routine maintenance and removal of the power source for major servicing. The mounting brackets and power source shall not interfere with the routine maintenance of the apparatus.

The instrumentation shall be permanently mounted at an operator's panel. The instruments shall be located in a plane facing the operator so they are readily visible under normal operating conditions. Gauges, switches, or other instruments on this panel shall be labeled to indicate their function.

INSTRUMENTATION:

Instructions that provide the operator with the essential power source operating instructions, including the power-up and power-down sequence, shall be permanently attached to the apparatus at any point where such operations take place.

OPERATION:

Provisions shall be made for quickly and easily placing the power source into operation. The control shall be marked to indicate when it is correctly positioned for power source operation.

Any control device used in the drive train shall be equipped with a means to prevent the unintentional movement of the control device from its set position.

A power source specification label shall be permanently attached to the apparatus near the operator's control station. The label shall provide the operator with the information detailed in NFPA.

Direct Drive, (PTO) generators, hydraulically driven generators, and portable generator installations shall comply with Article 445 (Generators) of the NEC.

OVERCURRENT PROTECTION:

Manually resetable overcurrent devices shall be installed to protect the line voltage electrical system components.

POWER SOURCE PROTECTION:

A main overcurrent protection device shall be provided that is either incorporated in the power source or is connected to the power source by a power supply assembly.

The size of the main overcurrent protection device shall not exceed 100% of the nameplate

	Bidder Complies	
	Yes	No

amperage rating on the power source specification label or the rating of the next larger available size overcurrent protection device when recommended by the power source manufacturer.

If the main overcurrent protection device is subject to road spray, the unit shall be housed in a Type 4 rated enclosure.

POWER SUPPLY ASSEMBLY:

The conductors used in the power supply assembly between the output terminals of the power source and the main overcurrent protection device shall not exceed 144" in length.

All power supply assembly conductors, including neutral and grounding conductors, shall have an equivalent amperage rating and shall be sized to carry not less than 115 percent of the amperage of the nameplate current rating of the power source.

For fixed power supplies, all conductors in the power supply assembly shall be Type THHW, THW, or use stranded conductors enclosed in nonmetallic liquidtight flexible conduit rated for a minimum of 194º F.

For portable power supplies, conductors located between the power source and the line side of the main overcurrent protection device shall be Type SO or Type SEO with suffix WA flexible cord, rated for 600 volts at 194º F.

WIRING METHODS:

Fixed wiring systems shall be limited to the following:

(a) Metallic or nonmetallic liquidtight flexible conduit rated at not less than 194º F; or
(b) Type SO or Type SEO cord with a WA suffix, rated at 600 volts at not less than 194º F.

Electrical cord or conduit shall not be attached to chassis suspension components, water or fuel lines, air or air brake lines, fire pump piping, hydraulic lines, exhaust system components, or low voltage wiring. It shall be:

(a) Separated by a minimum of 12" from exhaust piping or properly shielded; and
(b) Separated from fuel lines by a minimum of 6".

A means shall be provided to allow "flexing" between the cab, body, or equipment whose movement would stress the wiring.

Electrical cord or conduit shall be supported within 6" of any junction box and at a minimum of every 24" of run. Supports shall be made of nonmetallic materials or corrosion protected metal. All supports shall be of a design that does not cut or abrade the conduit or cable and shall be mechanically fastened to the vehicle.

	Bidder Complies	
	Yes	No

WIRING IDENTIFICATION:

All line voltage conductors located in the main panel board shall be individually and permanently identified. The identification shall reference the wiring schematic or indicate the final termination point.

When prewiring for future power sources or devices, the unterminated ends shall be labeled showing function and wire size.

RECEPTACLES:

All receptacles shall be marked with the type of line voltage (120 volts or 240 volts) and the current rating in amps. If the receptacles are DC or other than single phase, they shall be so marked.

LISTING:

All receptacles and electrical inlet devices shall be listed to UL 495, (Standard for safety Attachment Plugs and Receptacles) or other appropriate performance standards. Receptacles used for DC voltages shall be rated for the appropriate DC service.

ELECTRICAL SYSTEM TESTING:

The wiring and associated equipment shall be tested by the apparatus manufacturer or the installer of the line voltage system.

The wiring and permanently connected devices and equipment shall be subjected to a dielectric voltage and withstand a test of 900 volts for 1 minute. The test shall be conducted between live parts and the neutral conductor, and between live parts and the vehicle frame with any switches in circuit(s) closed. This test shall be conducted after all body work has been completed. The dielectric tester shall have a 500 VA or larger transformer with a sinusoidal output voltage that can be verified.

Electrical polarity verification shall be made of all permanently wired equipment and receptacles to determine that connections have been properly made.

OPERATIONAL TEST:

The apparatus manufacturer shall perform the following operation test and shall certify that the power source and any devices that are attached to the line voltage electrical system are properly connected and in working order.

The prime mover shall be started from a cold start condition and the line voltage electrical system loaded to 100% of the nameplate rating. The following information shall be recorded:

(a) The cranking time until the prime mover starts and runs, if applicable;

	Bidder Complies	
	Yes	No

(b) The voltage, frequency, and amperes at continuous full rated load;
(c) The prime mover oil pressure, water temperature, transmission temperature, hydraulic temperature, and the battery charge rate, as applicable;
(d) The ambient temperature and altitude.

The power source shall be operated at 100% of its nameplate voltage for a minimum of 2 hours. Testing at unity power factor is acceptable, provided that rated load tests are rated power source manufacturer. The conditions specified above in (b) and (c) shall be recorded at least every half hour during the test.

Where the line voltage power is derived from the vehicle's low voltage system, the minimum continuous electrical load as defined by NFPA 1901-1996 shall be applied to the low voltage electrical system during the operational test. Any termination of line voltage power by the low voltage load management system shall be noted and the duration of the periods of line voltage power source shutdown shall be recorded.

Vehicle support systems that are required to maintain the power source in operation shall remain within their required operational parameters.

The results of the tests listed in this section shall be supplied to the purchaser at the time of delivery.

CIRCUIT BREAKER BOX:

The main circuit breaker box shall incorporate six (6) 120-Volt circuits. Each over-current protection device shall be marked to identify the function of the circuit it protects.

The circuit breaker box shall be located in the R1 compartment, on back wall at the floor level. The breaker box mounting location shall reduce the compartment depth by approximately 6".

ELECTRIC CORD REEL:

One (1) Hannay Model ELFCR1624-10-11-6 low profile electric cord reel shall be installed in the specified compartment. Each reel shall include 4-way rollers and an HS-3 ball stop. Each reel shall include a 12 V rewind motor and rewind button at the reel location.

LOCATION: R3

100 feet of rubber coated black 10/3 SO cord shall be included with each reel.

JUNCTION BOX:

One (1) Akron Brass, Electrical Junction Box item EJBX shall be provided. The Electrical Junction Box shall be constructed of heavy-duty, cast aluminum with a quarter of an inch (¼") thick walls and the four corner edges shall be at least one half of a inch (½") thick to

	Bidder Complies	
	Yes	No

withstand the roughest of handling. The Electrical Junction Box shall be powder coated gray in color. A carrying handle shall be an integral part of the Junction Box casting and be large enough to fit a fully gloved hand. The junction box must be internally lit. Each side of the electrical junction box shall be fitted with polypropylene faceplates. The faceplates shall be backlit so that plug orientation to the receptacle is quick and easy to align. Each electrical junction box shall be equipped with four (4) receptacles (two on each side) as specified by the user. Each receptacle shall be equipped with a spring-loaded snap cover and marked in white lettering with that receptacles voltage and ampere rating. All electrical receptacles, plugs and snap type weatherproof covers shall be UL Listed components.

The inlet shall be a 12" pigtail with a grounded NEMA plug.

LOCATION:

120 VOLT POWER STRIP:

Three (3) 120-Volt power strip(s), model TLP88USBB, shall be mounted on the apparatus. Each power strip will have eight (8) on/off switch controlled, continuously powered outlets, two (2) 2.1 amp USB outlets and a fifteen (15) amp circuit breaker. Each power strip shall be powered from the shoreline connection and hard wired to the apparatus for dependability.

The power strip(s) shall be located on the Back of Doghouse

The additional power strip(s) shall be located:

The power strip(s) shall be located in the following body compartment(s). The power strip in each compartment shall be mounted on a plate on the unistrut tracking on the front wall.

LOCATION(S): One (1) each in L3 and R3

BRACKETING:

INTERMEDIATE REAR STEP:

An intermediate rear step constructed of 12 gauge star punch stainless steel material shall be located at the rear of the apparatus between the lower compartment and the ladder compartment. The step shall be 8" deep.

WHEEL CHOCKS:

One (1) pair of Ziamatic #2-SAC-44 folding wheel chocks shall be provided with the apparatus. The chocks shall be mounted in a location that is easily accessible.

FINISH:

COMPARTMENT INTERIOR FINISH:

	Bidder Complies	
	Yes	No

The interior of the compartments shall be natural finish stainless steel

CAB LETTERING:

Vinyl lettering as described below shall be applied to the chassis cab door, one (1) each side. Each letter shall be 2½" to 3½" high and hand applied.

Vinyl letters/numbers shall be applied to the chassis cab fender area, one (1) each side. Each letter/number shall be 2½" to 3½" high and hand applied.

The lettering vinyl style shall be simulated gold leaf.

The lettering font style shall be Eurostile Bold.

The lettering font highlight type shall be shadow.

REFLECTIVE STRIPING:

The finished apparatus shall be striped white with 6" reflective Scotchlite striping.

SHADED 'S':

There shall be a shaded 'S' design within the reflective stripe on each side of the apparatus.

DIAMOND GRADE CHEVRON STRIPING:

The rear of the apparatus shall be striped with Diamond Grade retro-reflective striping. The striping shall be applied in a chevron pattern sloping downward and away from the centerline of the apparatus at a 45º angle. The striping shall be single color alternating between red #3992 and flourescent yellow-green #3983.

The striping shall be applied in the following locations: Full height on the rear of the compartments on each side and above the rear compartment door.

EQUIPMENT:

One (1) Duo-Safety #10-585A aluminum folding 10' attic ladder(s).

One (1) Duo-Safety 14-775A, 14' Roof Ladder(s) with hooks.

One (1) Duo-Safety #24-900A, 24' 2 Section ground ladder(s).

Two (2) 10' Length(s) of 6" diameter hard suction hose, coupled 6" LHF x 6" RLM. (Not rated for hydrants)

	Bidder Complies	
	Yes	No

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 1901for each apparatus classification (see below) which is not specified in this proposal shall be considered to be customer supplied and installed.

Apparatus Type	NFPA Section
Pumper	5.8
Initial Attack	6.7
Mobile Water Supply	7.7
Aerial	8.8
Quint	9.8
Special Service	10.5
Mobile Foam	11.9