Invitation for Bids
IFB-4581-19-SH

FIRE ENGINE PUMPER TRUCK (QTY 2)

RESPONSES DUE:

January 3, 2019
Prior to 2:30 PM Local Time

Accepting Electronic Responses Only
Responses Only Submitted Through the Rocky Mountain E-Purchasing System
www.bidnetdirect.com/colorado
(Purchasing Representative does not have access or control of the vendor side of RMEPS. If website or other problems arise during response submission, vendor MUST contact RMEPS to resolve issue prior to the response deadline. 800-835-4603).

PURCHASING REPRESENTATIVE:
Susan Hyatt
Phone (970)244-1513
susanh@gjcity.org

This document has been developed specifically to solicit competitive responses for this solicitation, and may not be the same as previous City of Grand Junction solicitations. All vendors are urged to thoroughly review this solicitation prior to responding. Submittal by **FAX, EMAIL OR HARD COPY IS NOT ACCEPTABLE** for this solicitation.

Table of Contents

SECTION I. INTRODUCTION

A. Purpose: The Owner is interested in purchasing **Two (2), New or Demonstration Model, Fire Engine Pumper Trucks.** In comparing responses, consideration will not be confined to price only. The successful vendor will be one whose product is judged to best serve the interests of the Owner.

B. The Owner: The Owner is the City of Grand Junction, Colorado and is referred to throughout this Solicitation. The term Owner means the Owner or his authorized representative.

C. Timeline:

- Invitation for Bids Available — November 26, 2018
- Last Day for Questions, prior to 12:00 PM MST — December 14, 2018
- Addenda Issued (If required) by: — December 20, 2018
- Responses Due prior to 2:30 P.M. — January 3, 2019

SECTION II. INSTRUCTIONS TO BIDDER

A. Equipment Details and Literature Required: ***Each bid shall be submitted in electronic format only, and only through the BidNet Colorado website (***www.bidnetdirect.com/colorado). *This site offers both "free" and "paying" registration options that allow for full access of the Owner's documents and for electronic submission of proposals. (Note: "free" registration may take up to 24 hours to process. Please Plan accordingly.)* Please view our "**Electronic Vendor Registration Guide"** at www.gjcity.org/business-and-economic-development/bids for details. (Purchasing Representative does not have access or control of the vendor side of RMEPS. If website or other problems arise during response submission, vendor **MUST** contact RMEPS to resolve issue prior to the response deadline. **800-835-4603**). All bids must be accompanied by specification sheets and/or descriptive brochures showing the detailed specifications of the equipment you propose to furnish for the bid price. All equipment will be furnished with all standard equipment as described by the literature presented with the bid proposal. References to items shown on the literature, which the bidder does not intend to supply, must be so noted in writing as an amendment to the literature. It is the bidder's responsibility to provide specific equipment details to permit proper evaluation of the bid; failure to do so may result in disqualification of the bid.

The body, finish, fittings and all components shall be the latest and most current model, and shall not have been used as a demonstrator or any other service, and shall be factory standard in all respects not in conflict with the attached Owner bid specifications. If the Owner is interested in a demonstrator, such information will be supplied in the bid specifications.

The design of the vehicle/equipment must be such that it does not hamper or restrict subsequent installation and use of emergency equipment, such as emergency lights and backup alarms.

When specifications for particular items are not defined, manufacturer's standards are satisfactory, provided the item is required for the proper performance of the equipment.

B. Emissions Standards: As applicable by law: Vehicles/Equipment must be supplied with manufacturer's standard equipment and all devices necessary to be in compliance with the most current State of Colorado code, and the Federal Motor Vehicle Safety Standards. Vehicle must comply with all Federal and Colorado motor vehicle pollution control requirements and be capable of passing State emissions tests. Delivery must include any EPA documentation. Vehicles and/or Equipment not meeting the aforementioned standards will not be accepted.

C. Error and Omissions: If the bidder discovers any errors, omissions, lack of clarity or desires further information about the specifications, the Purchasing Representative should be contacted immediately.

D. Guarantee: All equipment, units and components shall be guaranteed in accordance with the following clauses:

a. Guarantee that the equipment offered is free from defects in design and construction and that it will give continuous and efficient service under normal conditions for the duration of the warranty period.

b. Guarantee that the equipment or vehicle is the manufacturer's standard design in construction and that no changes or substitutes have been made, unless otherwise stated.

E. Warranty: All equipment bids must include the manufacturer's standard warranty, and this information shall be provided with the bid. Additional or extended warranties may be requested; if so, specific warranty information must be provided with the bid. The warranty period shall commence after the equipment/vehicle is received and accepted by the Owner, unless special provisions are made with the successful provider.

F. Operating/Maintenance Instruction: Where specifically requested in the specifications, the bidder/supplier will instruct a given number of Owner employees in the operation and maintenance of equipment. The instructions shall be of the scope and length to orient personnel in: operating techniques, safety precautions, frequent inspection and servicing requirements, mechanical adjustments and repairs unique to the equipment or vehicle. Instructions will be required at the Owner site specified and provided on a schedule arranged after delivery of the equipment. If available, manufacturer shall provide an operational safety video for specialty equipment (chippers, stump cutters, leaf machines, etc.) Instruction schedules will be agreed to prior to invoice payment.

G. Delivery Date: All bids must be submitted with a delivery date.

H. Pre-delivery: Prior to delivery, new equipment/vehicle must be completely serviced in accordance with standard new vehicle "Make Ready" and to the manufacturer's specifications.

I. Delivery: All costs for delivery of the new unit will be assumed by the Bidder and included in the net price. Unless stated elsewhere in this bid document, all deliveries will be made to the City of Grand Junction, Fleet Services, 333 West Avenue, Building C, Grand Junction, CO 81501.

J. Prices: Prices quoted shall exclude Federal Excise and State taxes. Prices quoted shall be F.O.B. City of Grand Junction, CO 81501.

K. Final Payment: Final payment for equipment and vehicles delivered under these specifications will not be made until all terms and conditions have been satisfied.

L. Bid Evaluation Criteria: The evaluation of this bid will be based on, but not limited to, the following: Compliance with specifications; proven performance; ease of operation, life-cycle cost, net cost, supplier performance history; delivery time; compatibility with existing equipment, parts or supplies; service/parts availability; and, advantageous superior design features.

M. Repair and Parts Manuals: An *Operator's and Service manual* will be supplied with each new unit, except when units are duplicate orders and then only one of each is required. Manuals must be received prior to payment. Whenever available, the Owner prefers the manual in a CD format.

N. Additional Information: For information concerning the bid process, please contact the Purchasing Department at (970) 244-1533 or check the City of Grand Junction web page at www.gjcity.org. Copies of this bid document can be obtained online electronically on Bidnet at

www.bidnetdirect.com/colorado, from the Purchasing Division, **250 North 5th Street, Grand Junction, CO 81501, 970-244-1533**, or on the City of Grand Junction website, www.gjcity.org/business-and-economic-development/bids, click on "Bids".

O. Manufacturer's Statement of Origin: The new Unit shall be delivered with the Manufacturer's Statement of Origin (MSO). Failure to provide MSO shall be grounds to refuse to accept vehicle.

P. **Title:** The awarded supplier shall provide Title work for the new vehicle within 10 days after the receipt of payment from the Owner.

For City Purchases, mail or deliver the Title to: Fleet Services, 333 West Avenue, Building C, Grand Junction, CO 81501. If a problem arises in obtaining the Title within the 10 day window contact Tim Barker in Fleet Services at (970)-244-1532, or via E-mail timba@gjcity.org. Name on title shall read "**City of Grand Jctn**".

SECTION III. GENERAL TERMS AND CONDITIONS

A. Submission of Bids: ***Each bid shall be submitted in electronic format only, and only through the Rocky Mountain E-Purchasing website (www.bidnetdirect/colorado). This site offers both "free" and "paying" registration options that allow for full access of the Owner's documents and for electronic submission of proposals. (Note: "free" registration may take up to 24 hours to process. Please Plan accordingly.)*** **Please view our "Electronic Vendor Registration Guide" at www.gjcity.org/busines-and-economic-development/bids for details.** (Purchasing Representative does not have access or control of the vendor side of RMEPS. If website or other problems arise during response submission, vendor **MUST** contact RMEPS to resolve issue prior to the response deadline**. 800-835-4603**).

No bids will be considered in which the specifications, provisions or conditions of the price proposal have been modified. Bids shall be received and acknowledged only so as to avoid disclosure of process. However, all bids shall be open for public inspection after the contract is awarded. Trade secrets and confidential information contained in the bid so identified by Bidder as such will be treated as confidential by the Owner to the extent allowable in the Open Records Act.

B. Assignment/Contract not used as Collateral: Neither party shall assign or otherwise transfer any of the rights or delegate any of the duties set forth in this contract without prior written consent of the other party. The bidder shall not use this contract, or any portion thereof, for collateral for any financial obligation.

C. Audits/Access to Records: The Owner and any of its representatives shall have access to any books, documents, papers and records of the bidder which are pertinent to this solicitation and prospective contract.

D. Availability of Funds: Any Owner Contract resulting from a submission of a bid shall be deemed executor only to the extent of appropriations available to each Owner Department for purchases of such articles and services. The Owner's extended obligation on those contracts, which envision extended funding through successive fiscal periods shall be contingent upon actual appropriations for the following fiscal year.

E. Award and Purchase: The Owner reserves the right to reject any or all bids, to waive any informalities or technical defects in bids, and unless otherwise specified by the Owner or by the bidder, to accept any items or group of items in the bid, as may be in the best interest of the Owner. No verbal explanations, clarifications, additions or instructions will be binding to either the Owner or the bidders, except those confirmed in writing.

A signed purchase order/contract furnished to the successful bidder results in a binding contract without further action by either party.

F. Questions: Any questions concerning this project shall be directed to: Susan Hyatt at the City of Grand Junction, 250 North 5th Street, Grand Junction, Colorado 81501, (970)-244-1513, E-mail susanh@gjcity.org between the hours of 8:00 a.m. and 4:00 p.m., Monday through Friday, excluding Holidays. ALL QUESTIONS MUST BE SUBMITTED IN WRITING.

G. Legal Compliance: The bidder shall keep informed of all Federal, State and local laws; ordinances, regulations and all orders and decrees of bodies or tribunals having any jurisdiction or authority which may affect those engaged or employed on the work or affect the conduct of the work. The bidder shall observe and comply with all such laws, ordinances, regulations, orders and decrees. The bidder shall protect and indemnify the Owner and its representatives against any claim or liability arising from or based on the violation of any such law, ordinance, regulation, order or decree whether by the supplier, subcontractor, supplier or the supplier's employees or any others engaged by the supplier. The laws of the State of Colorado will govern as to the interpretation, validity and effect for any contract that is entered into as a result of this solicitation. Venue for any lawsuit will be in Mesa County, Colorado.

H. Force Majeure: Neither party shall be liable for failure to perform under this contract if such failure to perform arises out of causes beyond the control and without the fault or negligence of the non-performing party. Such causes may include, but are not limited to, acts of God or the public enemy, fires, floods, epidemics, quarantine restrictions, freight embargoes and unusually severe weather. This provision shall become effective only if the party failing to perform immediately notifies the other party of the extent and nature of the problem, limits delay in performance to that required by the event, and takes all reasonable steps to minimize delays. The provision shall not be effective unless the failure to perform is beyond the control and without the fault or negligence of the non-performing party.

I. Indemnification: The bidder shall release, indemnify and hold harmless the Owner, their officers, agents, employees, successors and assignees from any cause of action, or claims or demands arising out of the Bidder's performance under this contract.

J. Gratuities: The bidder certifies and agrees that no gratuities, kickbacks or contingency fees were paid in connection with this contract, nor were any fees, commissions, gifts or other considerations made contingent upon the award of this contract. If the bidder breaches or violates this warranty, the Owner may, at its discretion, terminate this contract without liability to the Owner.

K. Material Availability: Bidders must accept responsibility for verification of material availability, production schedules and other pertinent data prior to submission of bid and delivery time. It is the responsibility of the bidder to notify the Owner immediately if materials specified are discontinued, replaced or not available for an extended period of time.

L. OSHA Standards: All bidders agree and warrant that services performed in response to this invitation shall conform to the standards declared by the U.S. Department of Labor under the OCCUPATIONAL Safety and Health Act of 1970 (OSHA). In the event the services do not conform to OSHA Standards, the Owner may require the services to be redone at no additional expense to the Owner.

M. Non-collusion: Neither the said Bidder nor any of its officers, partners, owners, agents, representatives, employees or parties in interest, has in any way colluded, conspired, connived or agreed, directly or indirectly with any other bidder, firm or person to submit a collusive or sham bid in connection with the contract for which the attached bid has been submitted or to refrain from bidding in connection with such contract, or has in any manner, directly or indirectly, sought by agreement or collusion or communication or conference with any other bidder, firm or person or fix the price or prices

in the attached bid or of any other bidder, or to fix any overhead, profit or cost element of the bid price or the bid price of any other bidder, or to secure through any collusion, conspiracy, connivance or unlawful agreement and advantage against the Owner, or any person interested in the proposed contract.

The price or prices quoted in this bid are fair and proper and are not tainted by a collusion, conspiracy, connivance, or unlawful agreement on the part of the bidder or any of its agents, representatives, owners, employees, or parties in interest.

N. Public Disclosure Record: If the bidder has knowledge of their employee(s) or sub-contractors having an immediate family relationship with a Owner employee or elected official, the bidder must provide the Purchasing Representative with the name(s) of these individuals. These individuals are required to file an acceptable "Public Disclosure Record", a statement of financial interest, before conducting business with the Owner.

O. Preparation of Bids: Bidders are expected to examine any drawings, specifications, schedules and instructions included in the bid package. Failure to do so will be at the bidder's risk.

In case of error in the extension of prices in the bid proposal, the unit price will govern. Unit price shown must be net.

P. Tax Exemption: Direct purchases of materials by the Owner are exempt from Colorado State sales or use tax. The bidder certifies that no Federal, State, County or Municipal tax will be added to the price shown on the Proposal Price sheet. An Owner Tax Exemption Certificate will be supplied to the successful bidder upon request.

Q. Bids Binding – 60 Days: Unless otherwise specified all formal bids submitted shall be binding for sixty calendar days following the bid opening date unless bidders, at the request of the Owner, agree to an extension.

R. Multiple Bids: Bidders must determine for themselves which product to offer. If said bidder chooses to submit more than one bid, THE ALTERNATE BID must be clearly marked **"Alternate Bid."** The Owner reserves the right to make award in the best interest of the Owner.

S. Brand Names or Equal: Whenever in this bid invitation any particular materials, process, mechanism, and/or equipment are indicated, described or specified by patent, proprietary, or brand name, or by name of manufacturer, such wording will be deemed to be used for the purpose of facilitating minimum acceptable requirements and will be deemed to be followed by the words, "or equal." At the Owner's discretion, after the bid opening proof satisfactory must be provided by Bidder to show that the alternative product/equipment/vehicle is in fact, equal to specification requirements.

The Owner reserves the right to determine products of equal value. Suppliers will not be allowed to make unauthorized substitutions after award is made.

T. Termination of Contract: If at any time during the performance of the contract awarded as a result of this bid, in the opinion of the Owner, the work is not progressing satisfactorily or within the terms of this contract, then at the discretion of the Owner and after written notice to the supplier, the Owner may terminate the contract or any part of it.

U. Modification or Withdrawal of Bids: A bid that is in the possession of the Purchasing Division may be altered by facsimile, telegram or letter bearing the signature of name of the legal agent for the bidder, provided it is received prior to the time and date of the opening. Alterations should not reveal the price but should indicate the addition, subtraction or other changes in the bid. A bid that is in the possession of the Purchasing Manager may be withdrawn by the bidder up to the time of the bid opening.

Bids may not be withdrawn after the bid opening. Failure of the successful bidder to furnish the service awarded from this bid may eliminate the bidder from the active bidder's list.

V. Addenda and Interpretations: If it becomes necessary to revise any part of an Owner bid, a written addendum shall be posted to the Rocky Mountain E-Purchasing website and on the City's website at www.gjcity.org/business-and-econominc-development/bids. **The bidder shall be responsible for obtaining all solicitation documents**. The Owner is not bound by any oral representations, clarifications, or changes made in the written specifications by Owner employees, unless such clarification or change is provided in written addendum from the Owner. Receipt of addenda shall be acknowledged by initialing the proposal price sheet in the designated place.

W. Cooperative Purchasing: Purchases as a result of this solicitation are primarily for the Owner. Other governmental entities may be extended the opportunity to utilize the resultant contract award with the agreement of the successful provider and the participating agencies. All participating entities will be required to abide by the specifications, terms, conditions and pricings established in this solicitation.

The quantities furnished in this bid document are for only the Owner. It does not include quantities for any other jurisdiction.

The Owner will be responsible only for the orders placed for our jurisdiction. Other participating entities will place their orders on their respective Purchase Orders through their Purchasing office or use their purchasing card for purchase/payment as authorized or agreed upon between the provider and the individual entity. The Owner accepts no liability for payment of orders placed by other participating jurisdictions that choose to piggy-back on our solicitation.

Orders placed by participating jurisdictions under the terms of this solicitation will indicate their specific delivery and invoicing instructions.

X. Award: All bids will be awarded to the lowest responsive and responsible bidder. The Owner reserves the right to determine the lowest responsive and responsible bidder.

The Owner may involve all or some of the following factors: price; conformity to specifications; financial capacity to perform the services and/or provide commodities; previous performance and reputation; location of required and necessary facilities and/or equipment; availability and proximity of repair parts and/or warranty work; similar experience; delivery promise; terms of payments; compatibility as required in the bid documents; other associated and necessary costs; other objective and accountable factors which are reasonable.

Y. Inspections: Inspection and acceptance of materials or supplies will be made after delivery. Final inspection shall be conclusive except as regard to latent defects, fraud, or such gross mistakes as amount to fraud. Final inspection and acceptance or rejection of material or supplies shall be accomplished as promptly as practical, but failure to inspect and accept or reject material or supplies shall not impose liability on the Owner for such supplies as are not in accordance with the specifications. All delivered materials shall be accepted subject to inspection and physical count.

SECTION IV. SPECIFICATION/COMPLIANCE FORM

A. MINIMUM SPECIFICATION FOR Two (2), New or Demonstration Model, Fire Engine Pumper Trucks. Attempts have been made to not exclude one brand or manufacturer over another – all equivalent units are acceptable. Bids must be offered as a complete, turn-key unit. All specifications must be met or exceeded or may be considered non-responsive. Incomplete responses will not be considered. **Proposals shall note any exceptions to the bid on the Comments section.**

All parts not specifically mentioned herein, which are necessary to provide a complete unit, shall be included in the bid and shall conform in strength and quality of material and workmanship according to the industry standard.

VERIFICATION & CERTIFICATION INFORMATION FORM

Failure to submit this form filled out in its entirety could be grounds to find you non-responsive.

	Verification and Certification Information	Comply	Does Not Comply	Comments
1	**ISO Compliance:** The manufacturer shall operate a Quality Management System under the requirements of ISO 9001. These standards sponsored by the "International Organization for Standardization (ISO)" specify the quality systems that shall be established by the manufacturer for design, manufacture, installation and service. A copy of the certificate of compliance shall be included with the bid.			
2	**NFPA 1901-2009:** The National Fire Protection Association "Standard for Automotive Fire Apparatus, 2009 edition, is hereby adopted and made a part of these specifications, the same as if it were written out in full detail, with the exception of the section dealing with "Equipment Recommended for Various Types of Apparatus". Offerors shall provide the equipment requested herein. It is the intent of the City to purchase an apparatus that meets 100% of the minimum standards defined and outlined in NFPA 1901, newest edition. There are to be no exceptions to this requirement			
3	**NFPA 2009 Standards:** This unit shall comply with the NFPA standards effective January 1, 2009, except for fire department specifications that differ from NFPA specifications. These exceptions shall be set forth in the Statement of Exceptions. Certification of slip resistance of all stepping, standing and walking surfaces shall be supplied with delivery of the apparatus.			

	A plate that is highly visible to the driver while seated shall be provided. This plate shall show the overall height, length, and gross vehicle weight rating. The manufacturer shall have programs in place for training, proficiency testing and performance for any staff involved with certifications. An official of the company shall designate, in writing, who is qualified to witness and certify test results.			
4	**NFPA Compliancy:** Apparatus proposed by the bidder shall meet the applicable requirements of the National Fire Protection Association (NFPA) as stated in current edition at time of contract execution. Fire department's specifications that differ from NFPA specifications shall be indicated in the proposal as "non-NFPA"			
5	**Total Vehicle Assessment Certification:** The apparatus shall be third party, independent, audit certified through Underwriters Laboratory (UL) to the current edition of NFPA 1901 standards. The certification includes all design, production, operational and performance testing of the apparatus. (no exception)			
6	**Generator Test:** If the unit has a generator, the generator shall be tested, approved, and certified by Underwriters Laboratories at the manufacturer's expense. The test results shall be provided to the Fire Department at the time of delivery.			
7	**Breathing Air Test:** If the unit has breathing air, Underwriters Laboratories shall draw an air sample from the air system and certify that the air quality meets the requirements of NFPA 1989, *Standard on Breathing Air Quality for Fire and Emergency Services Respiratory Protection.*			
8	**Inspection Trip(s):** The bidder shall provide on-line access to assess the production of the aerial truck and mutually agreed upon on-site inspection trips.			
9	**Approval Drawing:** A drawing of the proposed apparatus shall be provided for approval before construction begins. The sales representative shall also have a copy of the same drawing. The finalized and approved drawing shall become part of the contract documents. This drawing			

	shall indicate the chassis make and model, location of the lights, siren, horns, compartments, major components, etc. A "revised" approval drawing of the apparatus shall be prepared and submitted by the manufacturer to the purchaser showing any changes made to the approval drawing.			
10	**Drawing, Preliminary Layout, Pump Operator's Panel:** A detailed drawing, to scale, of the pump operator's panel shall be provided for the purpose of illustrating the standard location(s) of controls and discharges on the pump operator's panel. The drawing shall not be meant as an approval, or final construction drawing, rather it shall be used as an illustration drawing of a standard panel layout. This drawing shall include all of the gauges and controls located on the pump operator's panel.			
11	**Warranty:** Each piece of new fire or rescue apparatus shall be warranted to be free from defects in materials or workmanship under normal use and service. Each manufacturer shall supply, as a part of their bid package, a copy of the warranty or warranties that they propose to provide, and in no case shall it be less than one (1) year on the entire apparatus. All other warranties, as outlined in these specifications shall be provided in writing as a part of the bid package. Failure to provide the warranties as outlined throughout these specifications shall be cause for rejection of the bid package.			
12	**Crossmembers Warranty:** A Lifetime parts and labor warranty shall be provided on all chassis frame crossmembers			
13	**Warranty 3-Year Custom Chassis:** Each new custom chassis shall be warranted to be free from defects in materials or workmanship under normal use and service. Each manufacturer shall supply, on company letterhead as part of their bid package, a copy of the detailed warranty or warranties that they propose to provide and in no case shall the custom chassis warranty be less than **three (3) years**. (Indicate the number of years the chassis warranty shall be in effect _____).			

	It shall include as the minimum the A/C, defroster and heater systems, spring suspension components, independent suspension components, steering gears on the independent suspension, gauge instrumentation, seats, instrument consoles, and a $10,000 collateral damage warranty on the transmission cooler. The electrical system, cab structural, engine, transmission, frame and crossmembers are to be covered under separate warranties throughout these specifications.			
14	**Additional Trucks:** The City of Grand Junction includes a provision in its Purchasing Policy to extend a solicitation for an additional year if mutual agreement exists between the City and the vendor. The City anticipates purchasing another apparatus later in 2019, however there is no guarantee with this statement. If the City does purchase an additional apparatus later in the year, will you (vendor) hold the price quoted on this solicitation? The City will not award this portion until January 2019.			**Hold price for 2019?** **YES or NO**

SPECIFICATION FORM

Failure to submit this form filled out in its entirety could be grounds to find you non-responsive.

SPECIFICATIONS: Two (2) Current Year or Demonstration Model **Fire Engine Pumper Trucks**. Offeror must meet or exceed the following specifications or the proposal shall be considered non-responsive.

EXCEPTIONS TO SPECIFICATIONS: Proposer shall mark corresponding box below and list on a separate sheet of paper variations from, or exceptions to the conditions and specifications of this solicitation. This sheet shall be labeled "Exception(s) to Bid Conditions and Specifications" and shall be the last page attached to the bid.

	SPECIFICATION	Meets	Does Not Meet	Comments
1.	**Body Structural Integrity Ten (10) Year Warranty:** The body shall be free of structural or design failure or workmanship for a period of ten (10) years or 100,000 miles starting thirty (30) days after the original invoice date.			
2.	**Paint Limited Warranty:** The apparatus body and pump house shall be free of blistering, peeling and any other adhesion defect cause by defective manufacturing methods or paint material selection for exterior surfaces for a period of three (3) years starting thirty (30) days after the original invoice date. Paint on the undercarriage, body interior (line-x coating included) or aerial structure related paint, if applicable, is covered only under the Standard One Year Limited Warranty.			
3.	**Corrosion Limited Warranty:** The body exterior paint shall be warranted against corrosion perforation for a period of ten (10) years starting thirty (30) days after the original invoice date.			
4.	**Stainless Steel Ten (10) Year Limited Plumbing Warranty:** The stainless steel plumbing shall be free from corrosion perforation for a period of ten (10) years starting thirty (30) days after the original invoice date.			
5.	**Basic Ninety (90) Day Limited Warranty on OEM Purchased Parts:** The apparatus shall be free of defects in material and workmanship for a period of ninety (90) days starting thirty (30) days after the original invoice date.			
6.	**Standard One (1) Year Warranty:** The apparatus shall be free of defects in material and workmanship for a period of one (1) year starting thirty (30) days after the original invoice date.			
7.	**Overall Height:** Specify overall height of vehicle measuring with tires properly inflated with the apparatus in the unloaded condition. The actual measurement shall be taken at the highest point of			

	SPECIFICATION	Meets	Does Not Meet	Comments
	the apparatus. **Measurement shall be noted on Response Form**			
8.	**Vehicle Top Speed:** The vehicle's top speed shall be _____mph. **Speed shall be noted on Response Form.**			
9.	**Overall Length:** The overall length of the vehicle shall be noted on **Response Form**			
10.	**Miscellaneous Equipment, Pumpers:** Miscellaneous equipment, as defined in the newest edition of NFPA 1901, Sections 5.8.2 and 5.8.3, shall be the responsibility of the City. The apparatus shall be designed and manufactured in such a manner as to provide ample enclosed space for which to store such equipment.			
11.	**Cab Style:** The cab shall be custom, fully enclosed. **(An optional 10" extended cab will be quoted separately in #150 below)**. The cab shall have a 10" raised roof over crew area, designed and built specifically for use as an emergency response vehicle by a company specializing in cab and chassis design for all emergency response applications. The cab shall be designed for heavy-duty service utilizing superior strength and capacity for the application of protecting the occupants of the vehicle. This style of cab shall offer up to six (6) seating positions. The cab shall incorporate a fully enclosed design with 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. 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 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.			

	SPECIFICATION	Meets	Does Not Meet	Comments
	The cab shall include a driver and officer area with two (2) cab doors large enough for personnel in full firefighting gear. The cab shall also include a crew area with two (2) cab doors, also large enough for personnel in full firefighting gear. The cab steps will allow personnel in full firefighting gear to enter and exit the cab easily and safely.			
12.	**Cab Undercoat**: There shall be a rubberized undercoating applied to the underside of the cab that provides abrasion protection, sound deadening and corrosion protection.			
13.	**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.			
14.	**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 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, the seams shall be sealed and painted with two (2) to four (4) coats of 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 cab shall then be painted with the specific color designated by the customer with a minimum			

	SPECIFICATION	Meets	Does Not Meet	Comments
	thickness of 2.00 mils of paint, followed by a clear top coat not to exceed 2.00 mils. The cab shall be painted with PPG Industries paint.			
15.	**Cab Paint Warranty:** The cab and chassis shall be covered by a limited manufacturer paint warranty which shall be in effect for ten (10) years from the first owner's date of purchase or in service or the first 100,000 actual miles, whichever occurs first.			
16.	**Cab Paint Interior:** The visible cab structure surfaces shall be painted.			
17.	**Cab Engine Tunnel:** The cab interior shall include an integrated engine tunnel constructed of 5052-H32 Marine Grade, 0.19 of an in thick aluminum or equivalent.			
18.	**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.			
19.	**Cab Structural Warranty:** The cab structure shall be warranted for a period of ten (10) years or one hundred thousand (100,000) miles, whichever may occur first. Warranty conditions may apply and shall be listed in the detailed warranty document that shall be provided upon request.			
20.	**Cab Test Information:** The cab shall have successfully achieved survival of the International crash test ECE-R29, Addendum 28, Revision 1 standards as indicated below. It shall also meet SAE J2420 COE Frontal Strength Evaluation Dynamic Loading Heavy Trucks and SAE J2422 Cab Roof Strength Quasi-Static Roof Load test requirements.			
21.	**Electrical System:** The chassis shall include a single starting electrical system which shall include a 12 volt direct current Weldon brand of multiplexing system, suppressed per SAE J551 or equivalent. 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 seal Deutsch			

	SPECIFICATION	Meets	Does Not Meet	Comments
	connectors shall be waterproof.			
22.	**Apparatus Wiring Provision:** An apparatus wiring panel shall be installed which shall include eight (8) open circuits consisting of three (3) 20 amp, one (1) 30 amp three (3) 10 amp, and one (1) 15 amp circuit with relays and breakers with trigger wires which shall be routed to the rocker switch panel.			
23.	**Data Recording System:** The chassis shall have a Vehicle Data Recorder (VDR) system installed. The system shall be designed to meet NFPA 1901 and shall be integrated with the Weldon Multiplex electrical system. The following information shall be recorded: • Vehicle speed • Acceleration • Deceleration • Engine speed • Engine throttle position • ABS Event • Seat Occupied Status • Seat Belt Status • Master Optical Warning Device Switch Position • Time • Date Each portion of the data shall be recorded at the specified intervals and stored for the specified length of time to meet NFPA 1901 guidelines and shall be retrievable by connecting a laptop computer to the VDR system.			
24.	**Power & Ground Stud**: 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 that shall be 0.38 inch diameter.			
25.	**Power & Ground Studs – Master Power:** Power and grounding studs shall be provided and installed behind the electrical center cover with a breaker. The studs shall be #10 and capable of carrying up			

	SPECIFICATION	Meets	Does Not Meet	Comments
	to a 40 amp load through the master power switch.			
26.	**Additional Power & Ground Stud:** An additional set of power and grounding studs shall be provided and installed behind the rocker switch panel. The power and ground stud shall be circuit protected with a 40 amp breaker. The studs shall be .375 inch diameter and capable of carrying up to a 40 amp ignition switched load.			
27.	**Exterior Electrical Terminal Coating:** All terminals exposed to the elements will be sprayed with a yellow protective rubberized coating to prevent corrosion.			
28.	**Engine:** The chassis engine shall be a Cummins ISM engine. **(NOTE: A CNG ENGINE WITH A 60 DGE TANK SHALL BE QUOTED AS AN OPTION ON THE RESPONSE FORM).** The ISL9 engine shall be an in-line six (6) cylinder, four cycle diesel powered engine. The engine shall offer a minimum rating of 400 horse power. The ISM engine shall feature a VGT™ Turbo-charger, a high pressure common rail fuel system, fully integrated electronic controls with an electronic governor, and shall be EPA certified to meet the 2010 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 CJ4 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.			
29.	**TO BE QUOTED AS AN OPTION:** Please include the option of an equivalent Detroit			

	SPECIFICATION	Meets	Does Not Meet	Comments
	brand engine.			
30.	**Engine Programming High Idle Speed:** The engine high idle control shall maintain the engine idle at approximately 1250 RPM when engaged.			
31.	**Engine High Idle Control**: The vehicle shall be equipped with 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 master switch is activated and the transmission is in neutral with the parking brake set. The device shall disengage when the operator depresses the brake pedal, or the transmission is placed in gear and shall be available to manually or automatically re-engage when the brake is released, or when the transmission is placed in neutral. There shall be an indication on the Vista screen for the high idle speed control.			
32.	**Engine Programming Road Speed Governor:** The engine programming which governs the top speed of the vehicle shall not be disabled.			
33.	**Auxiliary Engine Brake:** A compression brake, for the six (6) cylinder engine shall also 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.			
34.	**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 the following conditions are simultaneously detected: • A valid gear ratio is detected. • The driver has requested or enabled engine compression brake operation.			

	SPECIFICATION	Meets	Does Not Meet	Comments
	• The throttle is at a minimum engine speed position. • The electronic controller is not presently attempting to execute an electronically controlled final drive gear shift. The compression brake shall be controlled via on off/low/medium/high button. The multiplex system shall remember and default to the last engine brake control setting when the vehicle is shut off and re-started.			
35.	**Fluid Fills:** The engine oil, coolant, transmission, and power steering fluid fills shall be located under the cab. The windshield washer fill shall be accessible without the need for raising the cab.			
36.	**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.			
37.	**Engine Warranty:** The engine shall be warranted for a period of five (5) years or 100,000 miles, whichever occurs first.			
38.	**Engine Programming Idle Speed:** The engine low idle speed will be programmed at 700 rpm.			
39.	**Engine Fan Drive:** The engine cooling system fan shall be direct drive belt driven on the engine.			
40.	**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			

	SPECIFICATION	Meets	Does Not Meet	Comments
	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 eleven (11) blade fan with a 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 sight glass 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 ad recovery of coolant to a separate tank. All radiator tubes shall be formed from aluminized steel tubing. Recirculation shields shall be installed where required to prevent heated air from reentering the cooling package and affecting performance. The charge air cooler shall be a cross-flow design constructed completely of aluminum with cast tans. 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.			
41.	**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.			
42.	**Engine Coolant:** The cooling package shall include Extended Life Coolant (ELC). The use of			

	SPECIFICATION	Meets	Does Not Meet	Comments
	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 F. Proposals offering supplemental coolant additives (SCA) shall not be considered, as this is part of the extended life coolant makeup.			
43.	**Engine coolant Filter:** An engine coolant filter with a shut-off valve for the inlet and outlet shall be installed on the chassis. The locations of the filter shall allow for easy maintenance. Proposals offering engines equipped with coolant filters shall be supplied with standard non-chemical type particulate filters.			
44.	**Electronic Coolant Level Indicator:** The instrument panel shall feature a low engine coolant indicator light which shall be located in the center for the instrument panel. An audible tone alarm shall also be provided to warn of a low coolant incident.			
45.	**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.			
46.	**Coolant Hoses:** The cooling systems hose shall be formed silicone hose and formed aluminized steel tubing and include stainless steel constant torque band clamps.			
47.	**Engine Air Intake:** The engine air intake system shall include an ember separator air intake filter which shall be located in the front of the cab behind the right hand side fascia. This filter shall protect the downstream air filter from embers using a combination of unique flat and crimped metal screens constructed into a corrosion resistant steel frame. This multilayered screen shall be designed to trap embers or allow them to burn out before passing through the pack while creating only minimal air flow restriction through the			

	SPECIFICATION	Meets	Does Not Meet	Comments
	system. Periodic cleaning or replacement of the screen shall be all that is required after installation. The engine shall also include an air intake filter which shall be bolted to the frame and located under the front of the cab behind the right hand side. The dry type filter shall ensure dust and debris safely contained inside the disposable housing, eliminating the chance of contaminating the air intake system during air filter service via a leak-tight seal. The air flow distribution and dust loading shall be uniform throughout the high-performance filter cone pack, which shall result in pressure differential for improved horsepower and fuel economy. The air intake shall be mounted within easy access via a hinged panel behind the right hand side headlight module. 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.			
48.	**Engine Exhaust System:** The exhaust system shall include a diesel particulate filter (DPE), a diesel oxidation catalyst, 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 injected into the system through the decomposition tube between the DPF and SCR. The system shall utilize 0.065 inch thick stainless steel exhaust tubing between the engine turbo and the DPF. Zero leak clamps seal all system joints between the turbo and DPF. The DPF, the decomposition tube, and the SCR canister through the end of the tailpipe shall be connected with zero leak clamps. The discharge shall terminate horizontally on the right side of the vehicle ahead of the rear tires.			

	SPECIFICATION	Meets	Does Not Meet	Comments
49.	**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.			
50.	**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.			
51.	**Engine Exhaust Wrap:** The exhaust tubing between the engine turbo and the diesel particulate filter (DPF) shall be wrapped with a thermal cover in order to retain the necessary heat for DPF regeneration. The exhaust wrap shall also help protect surrounding components from radiant heat which can be transferred from the exhaust.			
52.	**Transmission:** The drive train shall include and Allison Gen IV-E 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 TransSynd™ 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 Gen IV-E transmission shall include prognostic capabilities. These capabilities shall			

	SPECIFICATION	Meets	Does Not Meet	Comments
	include the monitoring of the fluid life, filter change indication, and transmission clutch maintenance. 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 • Rev 5.03:1			
53.	**Transmission Mode Programming:** The transmission, upon start-up, will automatically select a four (4) speed operation. The fifth speed over drive shall be available with the activation of the mode button on the shifting pad.			
54.	**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.			
55.	**Transmission Shift Selector:** An Allison pressure sensitive range selector touch pad, or equivalent, shall be provided and located to the right of the driver within clear view and easy reach. The shift selector shall provide a prognostic indicator (wrench symbol) on the digital display between the selected and attained indicators. The prognostics monitor various operating parameters to determine and shall send an alert when a specific maintenance function is required.			
56.	**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.			
57.	**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.			
58.	**Transmission Warranty:** The Allison EVS series transmission shall be warranted for a period of five			

	SPECIFICATION	Meets	Does Not Meet	Comments
	(5) years with unlimited mileage. Parts and labor shall be included in the warranty.			
59.	**Driveline:** All drivelines shall be heavy duty metal tube and equipped with Spicer 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®.			
60.	**Fuel Filter/Water Separator:** The fuel system shall have a 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.			
61.	**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 (or CNG, as required). The fuel lines shall be connected with brass fittings.			
62.	**Fuel Tank:** The fuel tank shall have a capacity of fifty (50) gallons minimum.			
63.	**Fuel Tank Fill Port:** The fuel tank fill ports shall be offset with the right fill port located in the middle position and the left fill port located in the rearward position on the fuel tank.			
64.	**Front Axle:** The front axle shall be a Non drive front axle, model.			
65.	**Front Axle Warranty:** The front axle shall be warranted two (2) years with unlimited miles under the general service application.			
66.	**Front Wheel Bearing Lubrication:** The front axle wheel bearings shall be lubricated with oil. The oil level can be visually checked via clear inspection windows in the front axle hubs.			
67.	**Front Shock Absorbers:** Two (2) Bilstein inert, nitrogen gas filled shock absorbers, or equivalent, 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			

	SPECIFICATION	Meets	Does Not Meet	Comments
	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 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.			
68.	**Front Suspension:** The front suspension shall include a nine (9) leaf spring pack in which the longest leaf measures 54 inches long and 4 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 great fitting. The spring capacity shall be 21,500 pounds.			
69.	**Steering Column/Wheel:** The cab shall include a Douglas Autotech steering column, or equivalent, which shall include a seven (7) position tilt, a 2.25 inch telescopic adjustment, and an 18 inch, two (2) spoke 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-cancelling turn signal switch, four-way hazard switch and headlamp dimmer switch.			
70.	**Power Steering Pump:** The hydraulic power steering pump shall be a TRW PS, or equivalent, which shall be gear driven from the engine. The pump shall be a balanced, positive displacement, sliding vane type.			
71.	**Electronic Power Steering Fluid Level Indicator:** The power steering fluid shall be monitored electronically and shall send a signal to activate an audible alarm and visual warning in the instrument panel when fluid level falls below normal.			
72.	**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.			
73.	**Power Steering Gear:** The power steering gear shall be a TRW model TAS 65 with an assist cylinder, or equivalent.			

	SPECIFICATION	Meets	Does Not Meet	Comments
74.	**Rear Axle:** The rear axle shall be single drive axle. The axle shall include precision forged, single reduction differential gearing, and shall have a fire service rated capacity of 27,000 pounds.			
75.	**Rear Axle Differential Lubrication:** The rear axle differential shall be lubricated with oil.			
76.	**Rear Axle Warranty:** The rear axle shall be warranted for two (2) years with unlimited miles under the general service application.			
77.	**Rear Wheel Bearing Lubrication:** The rear axle wheel bearing shall be lubricated with oil.			
78.	**Vehicle Top Speed:** The top speed of the vehicle shall be approximately 65 MPH +/- 2 MPH at governed engine RPM.			
79.	**Rear Suspension:** The single rear axle shall feature a Reyco 79KB vari-rate, or equivalent, self-leveling captive slipper type conventional multi-leaf spring suspension, with 57.5 inch x 3 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.			
80.	**Front Tire:** The front tires shall be Michelin 385/65R-22.5 18PR "J" tubeless radial XZY3 mixed service tread. The front tire US Fire Service Intermittent Usage load capacity shall be 20,000 pounds per axle with a speed rating of 65 MPH when properly inflated to 120 lb/sq in.			
81.	**Rear Tire:** The rear tires shall be Michelin 315/80R-22.5 "L" tubeless radial XDY3 mixed service tread. The rear tire US Fire Service Intermittent Usage load capacity shall be 33,080 pounds per axle with a speed capacity of 65 MPH when properly inflated to 130 lb/sq in.			
82.	**Tire Pressure Indicator:** There shall be a voucher provided with the chassis for a dial style tire pressure indicator at the front and rear tire valve stem. The indicator shall provide visual indication of pressure in the specific tire. The tire pressure indicators shall be redeemed upon the vehicle manufacturer's receipt of the voucher for installation by the City.			
83.	**Front Wheels:** The front wheels shall be Accuride hub piloted, or equivalent, 22.5 inch x 12.25 inch polished aluminum wheels. The hub			

	SPECIFICATION	Meets	Does Not Meet	Comments
	piloted mounting system shall provide easy installation and shall include two-piece flange nuts. The wheels shall be forged from a single piece of aluminum, designed to be corrosion resistant and are engineered for a long life.			
84.	**Rear Wheels:** The rear wheels shall be Accuride hub piloted, or equivalent, heavy duty, 22.5 inch x 9 inch aluminum wheels. Each outer wheel shall have a polished aluminum finish on the exterior surface and each inner wheel shall have a machine finish. The hub piloted mounting system shall provide easy installation and shall include two-piece flange nuts.			
85.	**Wheel Trim:** The front and rear wheels shall include stainless steel lug nut covers. The lug nut covers shall be Real Wheels® brand, or equivalent, constructed of 304L grade, non-corrosive stainless steel. Each wheel trim component shall meet D.O.T. certification.			
86.	**Brake System:** A rapid build-up air brake system shall be provided. The air brakes shall include a two (2) air tank, three (3) reservoir system with a total of 4152 cubic inches 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. 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. 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			

	SPECIFICATION	Meets	Does Not Meet	Comments
	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. Automatic traction control (ATC) shall be installed on the single rear axle. The automatic traction control system shall apply the anti-lock braking system when the drive wheels lose traction. The system shall scale the electronic engine throttle back to prevent wheel spin while accelerating on ice or wet surfaces. System shall include roll stability control which shall monitor the vehicle's rollover threshold based on the lateral acceleration. The system shall activate a computerized device which shall slow the vehicle when the threshold is exceeded in either direction. Normal vehicle operation shall resume once the problematic conditions cease. Roll stability control shall be integral with the ABC and ATC systems. A switch shall be provided and properly labeled "mud/snow". When the switch is pressed once, the system shall allow a momentary wheel slip to obtain traction under extreme mud and snow conditions. During this condition the ATC light shall blink continuously notifying the driver of activation. Pressing the switch again shall deactivate the mud/snow feature. An electronic stability control unit (ESC) shall be a functional extension of the electronic braking system. It shall detect any skidding of the vehicle on the vertical axis as well as any rollover tendency. The control unit shall have an angular-speed sensor that measures the vehicle's motion on the vertical axis. An acceleration sensor shall measure the vehicle's lateral acceleration. The system shall provide information on the lateral acceleration and steering angle to calculate a theoretical angular speed for the stable vehicle condition.			
87.	**Front Brakes:** The front brakes shall be Disc Plus disc brakes, or equivalent, with 17 inch vented rotors.			

	SPECIFICATION	Meets	Does Not Meet	Comments
88.	**Rear Brakes:** The rear brakes shall be disc type and shall include a cast iron shoe.			
89.	**Park Brake:** Upon application of the push-pull valve in the cab, the rear brakes shall engage via mechanical spring force by dual chamber rear brakes to satisfy the FMVSS parking brake requirements.			
90.	**Park Brake Control:** A Meritor-Wabco, or equivalent, manual hand control push-pull style valve shall operate the parking brake system. The parking brake actuation valve shall be mounted on the left hand dash to the right of the steering column within easy reach of the driver.			
91.	**Rear Brake Slack Adjusters:** The rear brakes shall include Meritor, or equivalent, automatic slack adjusters installed on the axle designed to offer reduced weight. The automatic slack adjusters shall feature a manual adjusting nut which cannot inadvertently be backed off and threaded grease fittings for easy serviceability.			
92.	**Air Dryer:** The brake system shall include a Wabco System Saver 1200, or equivalent, air dryer with an integral 100 watt heater with a Metri-Pack, or equivalent, sealed connector. The air dryer shall incorporate 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 shall allow 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.			
93.	**Front Brake Chambers:** The front brakes shall be provided with MGM, or equivalent, type 24 long stroke brake chambers.			
94.	**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 30/36 brake chamber shall have a 36 inch effective area.			
95.	**Air Compressor:** The air compressor shall be a Wabco SS318, or equivalent, single cylinder pass-through drive type compressor which shall be capable of producing 18.7 CFM at 1200 engine			

	SPECIFICATION	Meets	Does Not Meet	Comments
	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. Piston and bore finishing technology shall reduce oil consumption and increase the system component life.			
96.	**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 cleaner bracket on the right frame rail behind the officer step.			
97.	**Moisture Ejectors:** An automatic moisture ejector with a manual drain provision shall be installed on the wet tank of the air supply system. Manual pet-cock type drain valves shall be installed on all remaining reservoirs of the air supply system.			
98.	**Air Supply Lines:** A dual air system plumbed with color coded reinforced nylon tubing air lines shall be installed on the chassis. The primary (rear) brake line shall be green, the secondary (front) brake line red, the parking brake line orange and the auxiliary (outlet) shall be blue. Brass compression type fittings shall be used on the nylon tubing. All drop hoses shall include fiber reinforced neoprene covered hoses.			
99.	**Air Inlet Connection:** An air connection for the shoreline air inlet shall be supplied and installed in the left hand side lower front step in the forward position. The air inlet connector shall be plumbed to the air system with a check valve to prevent air from escaping through the inlet connector. The air connector supplied shall be a 0.25 inch size Tru-Flate Interchange, or equivalent, style manual connection compatible with Milton 'T' style, Myers 0.25 inch Automotive style and Parker 0.25 inch 10 Series connectors.			

	SPECIFICATION	Meets	Does Not Meet	Comments
100	**Vehicle Towed Air Supply Package:** The chassis shall include a vehicle towing air supply package. The air service brake connection shall be accomplished via trailer glad hands located under the left side of the front bumper. The mating surface of the glad hand connections shall be rotated horizontal. The glad hand connections shall be located in the forward position and shall protrude beyond the face of the front bumper when connected. The glad hands shall allow a service tow truck to tie into the disabled vehicle's air system and unlock the rear brakes.			
101	**Rear Air Tank Mounting:** If a combination of wheel base, air tank quantity, or other requirements necessitate the location of the one or more air tanks to be mounted rear of the fuel tank, these tank(s) shall be mounted perpendicular to frame.			
102	**Frame Warranty:** The frame and cross members shall carry a limited lifetime warranty. The detailed warranty document shall be provided upon request.			
103	**Frame Paint:** The frame shall be powder coated black prior to any attachment of 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 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 inches per pound at 2 mils. Any proposals offering painted frame 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.			
104	**Front Bumper:** The chassis shall be equipped with a severe duty front bumper constructed from structural steel channel. The bumper material shall be .38 thick ASTM A36 steel which shall measure 12 inches high with a 3.05 inch flange and shall be 104.5 inches wide with angled front corners.		`	
105	**Front Bumper Paint:** The front bumper shall be			

	SPECIFICATION	Meets	Does Not Meet	Comments
	painted the same as the lower cab color.			
106	**Front Bumper Extension Length:** The front bumper shall be extended approximately 18 inches ahead of the cab.			
107	**Front Bumper Apron:** The 18 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.			
108	**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 for 100 feet of 1 ¾" fire hose and 1 ½" discharge. 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 cover constructed of 0.19 inch thick bright embossed aluminum tread plate.			
109	**Front Bumper Compartment Cover Hardware:** The front bumper compartment cover shall include gas cylinder stays which shall hold the cover open. The cover shall be held in the closed position via a flush push button style latch.			
110	**Mechanical Siren:** The front bumper shall include an electro mechanical Federal Q2B™ siren, or equivalent, which shall be streamlined, chrome-plated and shall produce 123 decibels of sound at 10 feet. LOCATION: The siren shall be bumper mounted in a hidden position. An angled sound deflector shall direct the sound from the siren through a stainless grille mounted to the face of the bumper.			
111	**Air Horns:** The front bumper shall include two (2) Hadley brand E-Tone air horns, or equivalent, which shall measure 21 inches long with 6 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. The air horns shall be recess mounted in the front bumper face, one (1) on the right side of the			

	SPECIFICATION	Meets	Does Not Meet	Comments
	bumper in the inboard position relative to the right hand frame rail and one (1) on the left side of the bumper in the inboard position relative to the left hand frame rail.			
112	**Air Horn Reservoir:** One (1) air tank, with a 1200 cubic inch reservoir, 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 brake system.			
113	**Electronic Siren Speaker:** The bumper shall include one (1) Whelen Engineering Inc. model SA122FMP, or equivalent, cast aluminum speaker with a polished aluminum grille recess mounted within the bumper fascia. The speaker shall feature 100 watts of power. The electronic siren speaker shall be located on the front bumper face.			
114	**Front Bumper Tow Hooks:** Two (2) heavy duty chrome plated tow hooks shall be installed in a rearward position out of the approach angle area, bolted directly to the outside of each chassis frame rail with grade 8 bolts.			
115	**Tow Fork Provision:** A tow bar provision shall be installed on the front of the chassis and attached to the frame rails which shall allow the vehicle to be picked up from the front and towed.			
116	**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 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 hold down hooks are in place, it shall take the application of pressure from the hydraulic cab tilt			

	SPECIFICATION	Meets	Does Not Meet	Comments
	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 1.9 inch ball and be anchored to frame brackets with 1.25 inch diameter studs. A steel safety channel assembly 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.			
117	**Cab Tilt Control Receptacle:** The cab tilt control cable shall include a receptacle. The tilt pump shall include 8 feet of cable with a six (6) pin Deutsch receptacle with a cap.			
118	**Cab Windshield:** The cab windshield shall have a surface area of at least 2825 square inches and be of a two (2) piece wraparound design for maximum visibility. The glass shall include standard automotive tint. The left and right windshield shall be fully interchangeable. Each windshield shall be installed using black self-locking window rubber.			
119	**Glass Front Doors:** The front cab doors shall include a window. These windows shall have the capability to roll down completely into the door housing with a crank style handle on the inside of the door. A reinforced window regulator assembly shall be provided for severe duty use. The shall be an irregular shaped fixed window, 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.			
120	**Glass Tint:** The windows located in the cab shall have a standard dark automotive tint.			
121	**Glass – Rear Doors:** The rear right hand side door shall include a window. This window shall roll up and down manually with a crank style handle on the inside of the door. A reinforced window			

	SPECIFICATION	Meets	Does Not Meet	Comments
	regulator assembly shall be provided for severe duty use. The rear left hand side door shall include a window. This window shall roll up and down manually with a crank style handle on the inside of the door. A reinforced window regulator assembly shall be provided for severe duty use.			
122	**Glass – Side Mid:** The cab shall include a window on the officer's side behind the front and ahead of the crew doors. 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 cab shall include a window on the driver's side behind the front door and ahead of the crew door and above the wheel well. This window shall be fixed within this space and shall be rectangular in shape. The window shall be mounted using self-locking window rubber.			
123	**Climate Control:** The cab shall include a 57,500 BTU @ 425 CFM front overhead heater/defroster. The cab shall also include a combination heater air conditioning unit. This unit shall offer a temperature control valve and two (2) blowers offering three (3) speeds which shall be capable of circulating 550 cubic feet of air per minute. The unit shall be rated for 42,500 BTU/Hr of cooling and 36,000 BTU/Hr of heating. The temperature and blower controls shall be located on the heater/air conditioning unit. The air conditioning system shall perform as follows: - In 100 degree F ambient temperature, with 50% relative humidity and at 1200 engine RPM, the crew area will cool down to 72 degree F within 30 minutes. - Roof mounted condenser with adequate BTU to meet the performance specification. - The evaporator units will have an adequate BTU rating to meet the performance specifications. All defrost/heating systems shall be plumbed with one (1) seasonal shut-off valve at the front corner			

	SPECIFICATION	Meets	Does Not Meet	Comments
	on the right side of the cab. The air conditioner lines shall be a mixture of custom bend zinc coated steel fittings and Aero-quip GH 134 flexible hose, or equivalent, with Aero-quip EZ clip fittings, or equivalent. 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. The heating and defrosting controls shall be located on the front overhead climate control unit. There shall be additional heating and air conditioning controls located on the engine tunnel mounted climate control unit. The air conditioning compressor shall be a belt driven, engine mounted, open type compressor that shall be capable of producing a minimum of 32,000 BTU at 1500 engine RPMs. The compressor shall utilize R-134A refrigerant and PAG oil.			
124	**Front Underseat Heaters:** Two (2) 13,500 BTU heaters shall be provided and installed in the face of the seat riser storage area for the left and right front seats, one (1) each side. The fan controls shall be located on the Vista display and control screen(s). The auxiliary heater system hoses shall be silicone with stainless steel constant torque clamps approved for use with silicone hose. The auxiliary heater system shall include one (1) seasonal shut-off valve. The valve shall be supplied at the front of the right hand corner of the cab. The cab must be tilted to access the shut-off valve.			
125	**Cab Insulation:** The cab ceiling and walls shall include 1 inch thick foam insulation. The insulation shall act as a barrier absorbing noise a well as assisting in sustaining the desired climate within the cab interior.			
126	**Under Cab Insulation:** The underside of the cab tunnel surrounding the engine shall be lined with multi-layer insulation, engineered for application			

	SPECIFICATION	Meets	Does Not Meet	Comments
	inside diesel engine compartments (or CNG, as needed). The insulation shall act as a noise barrier, absorbing noise thus keeping the decibel level in the cab well within NFPA recommendations. Then engine tunnel insulation shall measure approximately 0.75 inch thick including a vertically lapped polyester fiber layer, a 1.0 lb/ft^2 PVC barrier layer, an open cell foam layer, and a moisture and heat reflective foil facing reinforced with a woven fiberglass layer. 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 3 mils of acrylic pressure sensitive adhesive and aluminum pins			
127	**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, or equivalent. 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.			
128	**Sun Visors:** The header shall include two (2) sun visors, one each side forward of the driver and officer seating positions above the windshield.			
129	**Dash Trim:** The entire dash area shall be constructed of 5052-H32 Marine Grade, 0.13 inch thick aluminum plate with appropriate ventilation.			
130	**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, or equivalent. The mat shall be held in place by pressure sensitive adhesive. The engine tunnel mat shall be trimmed with anodized aluminum stair nosing trim.			
131	**Auxiliary Power Point Engine Tunnel:** The cab interior shall include two (2) 12 volt cigarette lighter type receptacles and shall be connected directly to the batteries.			
132	**Under Cab Access Door:** The cab shall include			

	SPECIFICATION	Meets	Does Not Meet	Comments
	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.			
133	**Interior Door Trim:** The doors of the cab shall include an aluminum plate the same weight and grade as the cab on the interior of the door. The aluminum shall then be painted to match.			
134	**Cab Door Reflective Trim:** The interior of each door shall include high visibility reflective tape. A white reflective tape that measures 1 inch in width 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 measuring 6 inches in height.			
135	**Interior Grab Handle "A" Pillar:** There shall be two (2) handles installed inside the cab, one on each "A" post at the left and right door openings.			
136	**Interior Grab Handles:** Each front door shall include one (1) aluminum handle mounted horizontally on the interior door panels. The handles shall feature a textured black powder coat finish. A black powder coated cast aluminum handle shall be installed on the inside of each rear crew door. A 30 inch long handle shall extend horizontally the width of the window just above the window sill.			
137	**Interior Trim Color:** The cab interior vinyl trim surfaces shall be gray in color. The cab interior vacuum formed ABS composite trim surfaces shall be gray in color. The cab interior floor mat shall be gray in color. • Inner door panel • Entire center dash • Any accessory pods attached to the dash • Left hand dash • Right hand dash			
138	**Dash Panel Group:** The main center dash area shall include three (3) removable panels located one (1) to the right of the driver position, one (1) in the center of the dash and one (1) to the left of the officer position. The center panel shall be within comfortable reach of both the drive and officer.			

	SPECIFICATION	Meets	Does Not Meet	Comments
139	**Center Panel:** The center dash panel shall include six (6) switch positions in the upper left portion of the panel. A rocker switch with a blank legend installed directly above shall be provided for any position without a switch and legend designated by a specific option. The non-specified switches shall be two-position, black switches with a green indicator light. All switch legends shall have backlighting provided.			
140	**Left Panel:** The left dash panel shall include one (1) windshield wiper/washer control switch located in the left hand side of the panel. The switch shall have backlighting provided.			
141	**Right Panel:** The right dash panel shall include rocker switches to control electric siren, mechanical siren and air horn.			
142	**Seat Belt Warning:** A Weldon, or equivalent, seat belt warning system, integrated with the Vehicle Data Recorder system, shall be installed for each seat within the cab. The system shall provide a visual warning indicator and indicator light in the instrument panel, and an audible alarm. The warning system shall activate when any seat is occupied with a minimum of 60 pounds, the corresponding seat belt remains unfastened, and the park brake is released. The warning system shall also activate when any seat is occupied, the corresponding seat belt is fastened in an incorrect sequence, and the park brake is released. Once activated, the visual indicators and audible alarm shall remain active until all occupied seats have the seat belts fastened.			
143	**Seat Material:** The seats shall include a covering of high strength, wear resistant fabric made of durable ballistic polyester. A PVC coating shall be bonded to the back side of the material to protect from UV rays and block contaminated fluids.			
144	**Seat Driver:** The driver's shall be equipped with air ride and feature eight-way electric positioning.			
145	**Seat Officer:** The officer's seat shall be equipped with air ride and feature two-way manual adjustment and shall include a tapered and padded seat cushion. This model of seat shall have successfully completed the static load tests by FMVSS 207,			

	SPECIFICATION	Meets	Does Not Meet	Comments
	209, 210 and 302 in effect at the time of manufacture. The 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 model of seat shall also have successfully completed the flammability of materials used in the occupant compartments of motor vehicles as outlined in FMVSS 302. The officer's seat shall feature a SecureAll™, or equivalent, SCBA locking system which shall be one bracket model and store all 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 bracket system shall be an auto-locking device where the SCBA is pushed against the pivot arm to lock securely in place in all directions. The SecureAll™, or equivalent, 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.			
146	**Rear Facing Outer Seats:** The crew area shall include a seat in the rear facing outboard position. The seat shall feature a tapered and padded seat and cushion. The seat shall be mounted in a fixed position. This model of seat shall have successfully completed the static load tests by FMVSS			

	SPECIFICATION	Meets	Does Not Meet	Comments
	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. The rear facing outboard seat shall feature a Bostrom SecureAll™, or equivalent, self-contained breathing apparatus (SCBA) locking system which shall store all 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 bracket system shall be an auto-locking device where the SCBA is pushed against the pivot arm to lock securely in place in all directions. The SecureAll™, or equivalent, 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.			

	SPECIFICATION	Meets	Does Not Meet	Comments
	The rear facing outer seats shall offer special mounting positions which shall be 2 inches towards the rear wall offering additional space between the front seats and the outer rear facing seats. The crew position seat belts shall follow the standard orientation which extends from the outboard shoulder extending to the inboard hip.			
147	**Forward Facing Center Seats:** The crew area shall include two (2) forward facing center crew seats with both located at the center of the rear wall. The seat shall feature a tapered and padded seat, and cushion. The seat and cushion shall be hinged and compact in design for additional room and shall remain in the stored position until occupied. 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. The forward facing center seat shall feature a SecureAll™, or equivalent, self-contained breathing apparatus (SCBA) locking system which shall be one bracket model and store all 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.			

	SPECIFICATION	Meets	Does Not Meet	Comments
	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 bracket system shall be an auto-locking device where the SCBA is pushed against the pivot arm to lock securely in place in all directions. The SecureAll™, or equivalent, 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 forward facing center seats shall be installed facing the front of the cab. The forward facing center seating positions shall include an enclosed seat frame which is located and installed on the rear wall. The seat frame shall be constructed of 5052-H32 Marine Grade 0.19 inch thick aluminum plate. The seat box shall be painted with the same color as the remaining interior. There shall be one (1) access points to the seat frame storage area to the front. The access point shall be covered by a hinged door.			
148	**Cab Front Underseat Storage Access:** The left and right under seat storage areas shall have a vented aluminum hinged door with non-locking latch.			
149	**TO BE QUOTED AS AN OPTION:** Please include the option of a "clean cab" design with an enclosed cabinet in place of one (1) of the forward facing rear seats, and no SCBA brackets in any of the seats. Appropriate SCBA brackets will be placed in a cabinet in the body in that option.			
150	**TO BE QUOTED AS AN OPTION AS REFERENCED IN #11 ABOVE:** **10 (Ten) Inch Extended Cab and In Cab Roll Up Storage Cabinets:** The cab shall be extended			

	SPECIFICATION	Meets	Does Not Meet	Comments
	by 10 inches and there shall be two (2) roll up compartments in the crew area of the cab located to the outside of the forward facing seats. One (1) will be located on each side of the forward facing seats. The cabinets will be as large as space allows but the dimensions will be approximately 22”x50”x15”. **Price for adding this option shall be noted on the Response Form.**			
151	**Windshield Wiper System:** The cab shall include a dual arm wiper system which shall clear the windshield of water, ice and debris. There shall be two (2) windshield wipers which shall be affixed to a radial wet arm. The system shall include a single motor which shall initiate the arm in which both the left hand and right hand windshield wipers are attached, initiating a back and forth motion for each wiper. The wiper motor shall be activated by an intermittent wiper control located within easy reach of the driver’s position.			
152	**Electronic Windshield Fluid Level Indicator:** The windshield washer fluid level shall me monitored electronically. There shall be an indicator light or warning message when fluid level is low.			
153	**Cab Door Hardware:** The cab entry doors shall be equipped with exterior pull handles, suitable for use while wearing firefighter gloves. All cab entry doors shall include locks which are keyed alike. The door locks shall be designed to prevent accidental lockout.			
154	**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. **TO BE QUOTED AS AN OPTION:** Please include the option of power lock cab doors with keypad entry.			
155	**Grab Handles:** The cab shall include one (1) 18 inch knurled, anti-slip, one-piece exterior assist handle behind each cab door. The grab handle shall be made of 14 gauge 304 stainless steel and be 1.25 inch diameter to enable non-slip assistance with a gloved hand.			
156	**Cab Fenders:** Full width wheel well liners shall be installed on the extruded cab. Each two-piece liner shall consist of an inner liner 16 inches wide			

	SPECIFICATION	Meets	Does Not Meet	Comments
	made of vacuum formed ABS composite and an outer fenderette 3.5 inches wide made of 14 gauge 304 polished stainless steel.			
157	**Mud Flaps Front:** The front wheel wells shall have mud flaps installed on them.			
158	**Ignition:** A master battery system with a keyless tart ignition system shall be provided.			
159	**Battery:** The single start electrical system shall include six (6) Harris BCI 31 950 CCA batteries with a 210 minute reserve capacity and 4/0 welding type dual path starter cables per SAE J541., The cables shall have encapsulated ends with heat shrink and sealant.			
160	**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, or equivalent, 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.			
161	**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.			
162	**Battery Cable:** The starting system shall include cables which shall be protected by 275 degree F minimum high temperature flame retardant loom, sealed and encapsulated at the ends with heat shrink and sealant.			
163	**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. 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.			
164	**Alternator:** The charging system shall include a 270 amp Leece Neville 12 volt alternator. The alternator shall include a self-excited integral regulator.			

	SPECIFICATION	Meets	Does Not Meet	Comments
165	**Battery Conditioner:** A Kussmaul 1200 battery conditioner shall be supplied. The battery conditioner shall be mounted in the cab behind the driver's seat.			
166	**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.			
167	**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. An electrical inlet shall be installed on the left hand side of cab over the wheel well. The electrical inlet shall be connected to the battery conditioner. The Kussmaul electrical inlet connection shall include a red cover.			
168	**Headlights:** The cab front shall include four (4) rectangular halogen headlamps with separate high and low beams mounted in bright chrome bezels.			
169	**Front Turn Signals:** The front fascia shall include two (2) Whelen model 600, or equivalent, 4 inch x 6 inch programmable LED amber turn signals which shall be installed in a polished aluminum housing above and outboard of the front warning and head lamps.			
170	**Headlight Location:** The headlights shall be located on the front fascia of the cab directly below the front warning lights.			
171	**Side Turn/Marker Lights:** The sides of the cab shall include two (2) LED round side marker lights which shall be provided just behind the front cab radius corners.			
172	**Marker and ICC Lights:** In accordance with FMVSS, there shall be five (5) cab LED marker lamps designating identification, center and clearance provided. These lights shall be installed on the face of the cab within full view of other vehicles from ground level.			
173	**Ground Lights:** Each door shall include LED			

	SPECIFICATION	Meets	Does Not Meet	Comments
	NFPA compliant ground lights mounted to the underside of the cab step below each door. Each light shall include a polycarbonate lens, a housing which is vibration welded and a bulb which shall be shock mounted for extended life.			
174	**Step Lights:** The middle step located at each door shall include a recess mounted 4 inch round LED light which shall activate with the opening of the respective door.			
175	**Engine Compartment Light:** There shall be an 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.			
176	**Interior Overhead Lights:** The cab shall include a two-section Whelen, or equivalent, LED dome lamp with a red and clear lens located over each door. An additional two-section Whelen, or equivalent, LED dome lamp with a red and clear lens shall be provided over the engine tunnel which can be activated by individual switches on the lamp.			
177	**Do Not Move Apparatus Light:** The front headliner of the cab shall include a red Whelen 500 Series, or equivalent, 5mm LED light located in the center for greatest visibility. The light shall be clearly labeled "Do Not Move Apparatus". In addition to the flashing red light, an audible alarm shall be included which shall sound when a door is open and the parking brake is released. The light and alarm shall be interlocked for activation when a cab door is not firmly closed, an apparatus cabinet door is not closed and the parking brake is released.			
178	**Master Warning Switch:** A master switch shall be included. The switch shall feature control over all devices wired through it. Any warning device switches left in "ON" position when the master switch is activated shall automatically power up.			
179	**Headlight Flasher:** An alternating high beam headlamp flashing system shall be installed into the high beam headlamp circuit which shall allow			

	SPECIFICATION	Meets	Does Not Meet	Comments
	the high beams to flash alternately from left to right. Deliberate operator selection of high beams shall override the flashing function until low beams are again selected. Per NFPA, these clear flashing lights shall also be disabled "On Scene" when the park brake is applied.			
180	**Light Bar:** There shall be one (1) 72 inch LED light bar mounted on the cab with opticom capabilities.			
181	**Inboard Front Warning Lights:** The cab front fascia shall include dual Whelen series 600 Super, or equivalent, LED warning lights which shall offer multiple flash patterns including steady burn for solid colors and multiple flash patterns for split colors. The lights shall be surface mounted to the front fascia of the cab within a chrome bezel in the inboard position. The front warning lights mounted on the fascia in the inboard positions shall be red.			
182	**Outboard Front Warning Lights:** The cab front fascia shall include dual Whelen series 600 Super, or equivalent, LED warning lights which shall offer 14 flash patterns plus a steady burn for solid colors and 20 flash patterns plus a stead burn for split colors. The lights shall be surface mounted to the front fascia of the cab within a chrome bezel in the outboard position. The front warning lights mounted on the fascia for the outboard position shall be red.			
183	**Front Warning Switch:** The front warning lights shall be controlled. This switch shall be clearly labeled for identification.			
184	**Intersection Warning Lights:** The chassis shall include two (2) Whelen series 600 Super, or equivalent, LED 4 inch x 6 inch intersection warning lights, one (1) each side, which shall offer multiple flash patterns including steady burn for solid colors and multiple flash patterns for split colors. The intersection lights shall be red and mounted in the rear position on the side of the bumper.			

	SPECIFICATION	Meets	Does Not Meet	Comments
185	**Side Warning Lights:** The cab sides shall include a Whelen series 600 Super, or equivalent, LED 4 inch x 6 inch warning light, one (1) each side, which shall offer multiple flash patterns including steady burn for solid colors and multiple flash patterns for split colors. The warning lights located on the side of the cab shall be red and mounted over the front wheel directly over the center of the front axle.			
186	**Cab Mounted Search Lights:** There shall be one (1) Golight model 2020, or equivalent, permanent mount search lights installed on the apparatus cab. The light shall provide 400,000 candle power of light output from a weather resistant halogen bulb. The Golight, or equivalent, shall be capable of 370 degree rotation and 120 degree tilt. Each light shall be equipped with two hard wired remote controls located in the chassis cab.			
187	**Cab Mounted Command Light:** There shall be a Command Light model KL450 mounted on the roof of the cab.			
188	**Siren Control Head:** A code 3 Micro Com, or equivalent, 200 watt remote dual amplifier control head shall be provided and mounted on the dash in the switch panel in a location specific to the City's needs. Location to be determined after award.			
189	**Air Horn Activation:** The air horn activation shall be accomplished by one (1) Linemaster model SP491-S81, or equivalent, foot switch on the driver's side and one (1) rocker switch on the right side dash panel accessible to the officer.			
190	**Mechanical Siren Activation:** The mechanical siren shall be actuated by one (1) rocker switch on the right side dash panel for use by the officer. One (1) momentary siren brake rocker switch shall be provided in the right side dash panel.			
191	**Back-up Alarm:** A Preco-Matic model 1059, or equivalent, dual function, dual sound back-up alarm shall be installed at the rear of the chassis with an auto-adjusting output level of 87 dB to 112 dBa. The alarm shall automatically activate without delay when the transmission is placed in reverse.			
192	**Instrumentation:** An ergonomically designed instrument panel shall be provided. Each gauge shall be backlit with LED lamps. Stepper motor			

	SPECIFICATION	Meets	Does Not Meet	Comments
	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. The instrument panel shall contain the following gauges: • One (1) electronic speedometer • One (1) electronic tachometer. The scale on the tachometer shall read from 0 to 3000 RPM. • One (1) two-movement gauge displaying primary system and secondary system air volumes and integral LCD odometer/trip odometer shall be included on the lower portion of the LCD. The odometer shall display up to 9,999,999.9 miles. The trip odometer shall display 9,999.9 miles. The LCD shall display Transmission Temperature in degree Fahrenheit on the upper portion of the LCD. The LCD screen shall also be capable of displaying certain diagnostic functions. • One (1) four-movement gauge displaying engine oil pressure, coolant temperature, fuel level, voltmeter and an indicator bar displaying Diesel Exhaust Fluid (DEF) LED bar shall be included. The instrument panel shall include a light bar that will contain the flowing LED indicator lights: **A. Red Lamps:** • Low primary Air Pressure, located in gauge • Low Secondary Air Pressure, located in gauge • Stop Engine, indicates critical engine fault • Air Filter Restricted, indicates excessive engine air intake restriction • Park Brake, indicates parking brake set • Seat Belt Indicator, indicates when a seat is occupied and corresponding seat belt remains unfastened • Volts, indicates high or low system voltage, located in gauge • Low Oil Pressure, indicates low engine oil			

	SPECIFICATION	Meets	Does Not Meet	Comments
	pressure, located in gauge • High Coolant Temperature, indicates excessive engine coolant temperature, located in gauge • DEF level Bar, DEF level is critically low, located in gauge **B. Amber Lamps:** • MIL, indicates an engine emission control system fault • Check Engine, indicates engine fault • Check Trans, indicates transmission fault • High Transmission Temperature, indicates excessive transmission oil temperature • ABS, indicated anti-lock brake system fault • Wait to Start, indicates active engine air preheat cycle • HEST, indicates a high exhaust system temperature • Water in Fuel, indicates presence of water in fuel filter • DPF, indicates a restriction of the diesel particulate filter • Regen Inhibit, indicates regeneration has been postponed due to user interaction • Range Inhibit, indicates a transmission operation is prevented and requested shift request may not occur • Low Fuel, located in gauge • DEF, indicates low DEF fluid, located in gauge • DEF Level Bar, DEF level is low, located in gauge **C. Green Lamps:** • Left and Right turn signal indicators • ATC, indicates low wheel traction for automatic traction control, also indicates mud/snow mode is active for ATC system • High Idle, indicates high idle is active • Cruise Control, indicates cruise control is active • OK to Pump, indicates the pump engage conditions have been met			

	SPECIFICATION	Meets	Does Not Meet	Comments
	• Pump Engaged, indicates pump is in use • Auxiliary Brake, indicates secondary braking device is active • DEF Level Bar, indicates usable levels of DEF: 25%, 50%, 75%, 100%, located in gauge **D. Blue Lamps:** • High Beam indicator			
193	**Constant Audible Alarms From Gauge Package:** • High Trans Temp • High or Low Voltage • Seatbelt • Check Engine • Check Transmission • Stop Engine • Low Air Pressure • Fuel Low • Water in Fuel • ESC • High Coolant Temperature • Low Engine Oil Pressure • Low Coolant Level			
194	**Oscillating Audible Alarms From Gauge Package:** • Air Filter • Extended Left & Right Turn remaining on • Cab Ajar • Door Ajar • Low Oil Level			
195	**Backlighting Color:** The instrumentation gauges and the switch panel legends shall be backlit using red LED backlighting			
196	**Communication Antenna:** An antenna base, for use with an NMO type antenna, shall be mounted on the right hand front corner of the cab roof so not to interfere with light bars or other roof mounted equipment. The antenna base shall be an Antenex model MABVT8, or equivalent, made for either a 0.38 inch or 0.75 inch receiving hole in the antenna and shall include 17 feet of RG58 A/U cable with no connector at the radio end of the cable. The antenna base shall be provided by manufacturer.			

	SPECIFICATION	Meets	Does Not Meet	Comments
	The antenna cable shall be routed from the antenna base mounted on the roof to the area underneath the right hand front seat.			
197	**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.			
198	**Fire Extinguisher:** A 2.5 pound D.O.T. approved fire extinguisher with BC rating shall be shipped loose with the cab.			
199	**Road Safety Kit:** The cab and chassis shall include one (1) emergency road side triangle kit.			
200	**Door Keys:** The cab and chassis shall include a total of four (4) door keys for the manual door locks.			
201	**Operation Manuals:** There shall be two (2) complete sets of chassis operation manuals provided with the chassis. One (1) set shall be a printed hard copy and one (1) set shall be an electronic copy on CD or flash drive. Each manual shall include a parts list specific to the chassis model.			
202	**Engine and Transmission Operation Manuals:** There shall be two (2) printed hard copy sets of the engine operation manual and two (2) printed hard copy sets of the transmission operation manual specific to the model ordered included with the chassis in the ship loose items.			
203	**Engine Service Manuals:** There shall be one (1) printed hard copy set of Cummins ISC/ISL (or CNG as required) engine service reference manuals which shall be provided with the chassis.			
204	**Transmission Service Manuals:** There shall be one (1) printed hard copy set of Allison 3000 transmission service manuals included with the chassis.			
205	**As Built Wiring Diagrams:** The cab and chassis shall include two (2) complete sets of wiring schematics and option wiring diagrams. One (1) set shall be a printed hard copy, one (1) set shall be and electronic copy on CD or flash drive.			
206	**Fire Pump Mounting:** The fire pump shall be mounted within a separate body module that is not directly connected to the apparatus body. The pump module shall be mounted to the frame in			

	SPECIFICATION	Meets	Does Not Meet	Comments
	four (4) locations and shall be reinforced appropriately in order to carry the expected load for the life of the apparatus. **<u>TO BE QUOTED AS AN OPTION:</u>** Please include the option, if available, other pump configurations, i.e. "PUC" or equivalent design.			
207	**Midship Mount Fire Pump:** The fire pump shall be a 1250 GPM midship mount pump, or equivalent.			
208	**Single Stage Fire Pump:** The pump shall be a single stage centrifugal class "A" rated fire pump, designed specifically for fire service.			
209	**Independent Third Party Pump Certification:** The fire pump shall be tested and certified by Underwriter's Labs, a nationally recognized independent third party testing company. Tests shall be conducted so that the pump performs as listed below: • 100% of rated capacity at 150 pounds net pressure • 70% of rated capacity at 200 pounds net pressure • 50% of rated capacity at 250 pounds net pressure • 100% of rated capacity at 165 pounds net pressure The entire pump, both suction and discharge passages, shall be hydrostatically tested to a pressure of 600 PSI. The pump shall be fully tested at the pump manufacturer's factory to the performance spots as outlined by the latest NFPA pamphlet number 1901. The pump shall be free from objectionable pulsation and vibration.			
210	**Pump Anodes:** There shall be two (2) zinc anodes provided with the fire pump. The anodes shall aid in preventing galvanic corrosion within the water pump. The anodes shall be installed in the left and right steamer inlets and shall be easily replaceable. There shall be two (2) zinc anodes installed in the discharge manifold of the pump and shall be easily replaceable.			

	SPECIFICATION	Meets	Does Not Meet	Comments
211	**Impellers:** The pump impellers shall be bronze, specifically designed for fire service and accurately balanced for vibration free running. The stripping edges shall be located on opposite sides of the impellers to reduce shaft deflection. The impeller shaft shall be stainless steel, accurately ground to size and supported at each end by oil or grease lubricated anti-friction ball bearings for rigid, precise support. The bearings used on the impeller shaft shall be automotive type bearings, easily cross-referenced and readily available at normal parts or bearing stores.			
212	**Mechanical Seals:** The pump shall be equipped with self-adjusting, maintenance free mechanical shaft seals that shall not require manual adjustment. These seals shall be designed in a manner such that they shall remain functional enough to permit continued use of the pump in the unlikely event of a seal failure.			
213	**Impeller Wear Rings:** The pump shall be equipped with replaceable bronze wear rings for increased pump life and minimum maintenance cost. The wear rings shall be designed to fit into a groove in the face of the impeller hubs forming a labyrinth that, as the clearance increases with age, directs water from the discharge side in several directions eventually exiting outward, away from the eye of the impeller hub.			
214	**Pump Casing:** The pump casing shall be cast as two (2) horizontally split pieces. The casing shall be made of high tensile, close-grained gray iron with a minimum tensile strength of 40,000 PSI.			
215	**Pump Transmission:** The pump shall have a Waterous model C20 series transmission, or equivalent. The housing of the transmission shall be constructed of high strength, three piece, horizontally split aluminum. The drive line shafts shall be made from alloy steel forgings, hardened and ground to a size 2.350 inch 46 tooth involute spline. The drive and driven sprockets shall be made of steel and shall be hardened and have ground bores. The drive chain shall be a Morse HV™, or equivalent, high strength involute form chain. Bearings shall be deep groove, anti-friction ball bearings and shall give support and proper			

	SPECIFICATION	Meets	Does Not Meet	Comments
	alignment to the impeller shaft assembly. Bearings shall be oil splash lubricated, completely separated from the water being pumped, and protected by a V-ring and oil seal. An internal lubrication system shall deliver lubricant directly to the drive chain and shall eliminate the need for an external lubrication pump and auxiliary cooling. The pump and transmission shall be easily separable. A two-piece shaft shall be splined allowing for individual repair of either the pump or transmission. All drive line components shall have a torque rating equal to or greater than the final net engine torque.			
216	**Air Operated Pump Shift:** The pump shift actuating mechanism shall be air operated from a valve in the cab identified as "PUMP SHIFT". Full instructions for shifting the pump shall be inscribed on the valve plate.			
217	**Pump Shift Indicating Lights:** There shall be two (2) pump system shift indicator lights in the chassis cab. The first light shall become energized when the chassis parking brake has been set and the pump has completed its shift into pump gear and shall be labeled "Pump Engaged". The second light shall become energized and when the pump and the chassis transmissions have been shifted completely into the correct gears for pumping, this light shall be labeled "OK To Pump". There shall be one (1) pump system shift indicator light located on the operator's panel. This light shall only become engaged when the chassis parking brake has been set, and when the pump and the chassis transmissions have been completely shifted into the correct gears. The light shall be located adjacent to the throttle control and shall be labeled "Throttle Ready".			

	SPECIFICATION	Meets	Does Not Meet	Comments
218	**Primer:** The priming pump, model VPO/VPOS, or equivalent, shall be included in the pump assembly. The priming pump shall be an electrically driven rotary vane pump mounted firmly within the pump area. The pump shall be controlled from the pump operator's panel. An indicator light on the pump panel shall show when the primer motor is engaged. The pump shall be capable of creating suction and discharging water from a lift of 10 feet through 20 feet of suction hose of the appropriate size, in not more than 30 seconds starting with the pump dry. It shall be capable of developing a vacuum of 22 inches at an altitude of up to 1000 feet.			
219	**Priming Valve:** There shall be a Waterous model VPA, or equivalent, vacuum activated priming valve supplied with the pump. The valve shall open automatically when the priming system is activated. The valve shall be installed on the pump or mounted remotely.			
220	**Pressure Governor/Monitory Display:** A Fire Research Pump Boss, or equivalent, 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 ¾ inches high by 4 5/8 inches wide by 1 ½ inches deep. The control knob shall be 2 inches 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 ¾ inches from the front of the control module. Inputs for monitored information shall be from a J1939 data bus or independent sensors. Outputs for engine control shall be on the J1939 data bus or engine specific wiring. Inputs to the control module 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 ½ inch high · Check engine and stop engine warning LEDs			

	SPECIFICATION	Meets	Does Not Meet	Comments
	· Oil pressure; shown on a dual color (green/red) LED bar graph display · 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			

	SPECIFICATION	Meets	Does Not Meet	Comments
	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 monitoring pressure display shall be programmed to interface with the specific engine installed.			
221	**Intake Relief Valve:** There shall be an Elkhart 40-41, or equivalent, intake relief valve installed on the suction side of the pump. The valve shall be the preset type, adjustable from 75 to 250 PSI, and shall be designed to prevent vibration from altering the setting. The relief outlet shall be directed below the pump with the discharge terminating in a 2-1/2 inches male NST connection. The discharge shall be away from the pump operator and labeled "Do Not Cap".			
222	**Pump Drain Valve:** A Trident, or equivalent, manifold drain valve assembly shall be supplied. This drain shall provide the capability to drain the entire pump by turning a single control. The valve assembly shall consist of a stainless steel plate and shaft in a bronze body with multiple ports. The drain valve control shall be mounted on the left side pump panel and identified as "Master Drain".			
223	**Pump Lubrication System:** An internal lubrication system shall deliver lubricant directly to the drive chain and shall eliminate the need for an external lubrication pump and auxiliary cooing. Oil shall be supplied with the lubrication system.			
224	**Pump Cooler Line:** There shall be a ½ inch line installed from the discharge side of the pump to the water tank. The line shall be used to cool the pump during longer periods of pumping when			

	SPECIFICATION	Meets	Does Not Meet	Comments
	water is not being discharged. The pump cooler shall be controlled with a quarter-turn ball valve on operator's panel, and shall be clearly labeled "Pump Cooler".			
225	**Pump Cooler Check Valve:** There shall be a check valve installed in the pump cooler line to prevent tank water from back flowing into the pump when it is not in use.			
226	**Pump Manuals:** Two (2) Pump Operation & Maintenance manuals in CD format shall be supplied at the time of delivery.			
227	**Pump Operation Video:** There shall be one (1) pump operation and maintenance video(s) supplied at the time of delivery.			
228	**Five Year Pump Warranty:** The fir pump shall be warranted for a period of five (5) years from the date of delivery to Grand Junction Fire Department of five and one-half (5-1/2) years from the shipment date.			
229	**Tank To Pump Check Valve:** There shall be check valve between the pump suction and booster tank valve. The check valve shall eliminate back flow into the water tank when the pump is connected to a pressurized source.			
230	**Tank to Pump Valve:** There shall be one (1) 3 inch full flow ball valve connected with a flexible hose from the tank to the suction side of the pump.			
231	**Tank Fill Valve:** There shall be one (1) Akron 2 inch full-flow tank fill valve plumbed with 2 inch plumbing from the pump to the tank. Installation shall be completed with 2 inch Class 1 rubber hose and stainless steel hose couplings. The tank fill valve shall be controlled from the operator's control panel.			
232	**Direct Tank Fill:** There shall be one (1) 2 ½ inch direct tank fill valve located on the right side panel. It shall be furnished with a 2 ½ inch valve and 2 ½ inch plumbing. The intake shall terminate with a 2 ½ inch NST female chrome swivel.			
233	**Pump Paint:** The pump body shall be painted with PPG polyurethane enamel paint. The pump enclosure shall be painted the same color as the apparatus body.			
234	**Paint Steamer and Inlet Valves:** The steamer and partially recessed inlet valves shall be painted with PPG polyurethane enamel paint. The paint color			

	SPECIFICATION	Meets	Does Not Meet	Comments
	shall be the same as the apparatus body.			
235	**Intake Drains:** Each gated intake shall be equipped with a Trident Emergency, or equivalent, ¾ inch quarter turn bleeder valve. The bleeder valve shall be equipped with w chrome plated rectangular handle to provide a positive grip while personnel are wearing gloves.			
236	**Intake Trim Plates:** Each gated intake shall have a chrome plated die cast zinc trim plate around the intake valve and fitting. The trim plate shall be easily removable without the need to disturb the valve.			
237	**Slow Close Mechanisms:** Gates intakes that are 3 inches or larger shall be equipped with a mechanism to prevent changing the position of the valve from full open to full close, or vice versa, in less than 3 seconds.			
238	**Intake Strainers:** Removable strainers shall be provided with each gated intake.			
239	**Gate Intake:** There shall be one (1) 2 ½ inch gated intake provided on the left side of the pump compartment. The intake shall be furnished with a 2 ½ inch valve and 2 ½ inch plumbing. The intake shall terminate with a 2 ½ inch NST female chrome swivel. The suction valve(s) shall be an Akron 8800 series brass quarter-turn, full flow, and swing-out type. The valve shall be designed in such a manner that the action of water against the regulating element shall not affect its position. Each valve shall be individually attached to the manifold of the pump with stainless steel pipe. The plumbing to the valve shall contain a minimum of elbows to keep friction loss to a minimum. The valves located in the pump compartment area shall be partially recessed behind the panel in order to keep the valve protected from the elements. There shall be a South Park model HPC3008AC,or equivalent, 2½ inch NST plug with chain supplied. The plug shall be manufactured from high quality brass and shall be polished to remove manufacturing irregularities with a chrome finish applied to the polished surface.			

	SPECIFICATION	Meets	Does Not Meet	Comments
240	**Inlets, Steamer:** There shall be one 6 inch steamer inlet supplied on the left side of the pumper. The suction fittings shall include a removable die cast screen to provide cathodic protection for the pump thus reducing corrosion. To accommodate an intake valve without exceeding the legal overall body width, a shorter steamer barrel shall be installed on the left side of the apparatus. There shall be one (1) 6 inch NST thread, South Park LHC26P14AC long handle cap, or equivalent, provided. The cap shall be manufactured from high quality brass that shall be polished to remove manufacturing irregularities with a chrome finish applied to the polished surface. There shall be one 6 inch steamer inlet located on the right side of the pumper. The suction fittings shall include a removable die cast screen to provide cathodic protection for the pump thus reducing corrosion. To accommodate an intake valve without exceeding the legal overall body width, a shorter steamer barrel shall be installed on the right side of the apparatus. There shall be one (1) 6" NST thread, South Park LHC26P14AC long handle cap, or equivalent, provided. The cap shall be manufactured from high quality brass that shall be polished to remove manufacturing irregularities with a chrome finish applied to the polished surface.			
241	**Crosslays:** There shall be two (2) 1½ inch and one (1) 3 inch crosslays above the side mount control panel. Two (2) crosslay shall be plumbed with a full-flow 2 inch Akron style 8820 valve. Class 1 high pressure flex hose with stainless steel couplings shall be used in plumbing the discharge to a 1½ inch male swivel elbow. One (1) crosslay shall be plumbed with a full-flow 3 inch Akron style 8820 valve. Class 1 high pressure flex hose with stainless steel couplings shall be used in plumbing the discharge to a 3 inch male swivel elbow. The swivel for each crosslay hose bed shall be located outboard for ease of making connections while changing hose. The floor of the crosslay shall be covered with Dura-Dek, or equivalent, fiber reinforced material with adjustable dividers. Two (2) crosslay hose			

	SPECIFICATION	Meets	Does Not Meet	Comments
	bed shall have a capacity of 200 feet of 1¾ inch double jacket fire hose. One (1) crossslay hose bed will have a capacity of 200 feet of 2½ inch double jacket fire hose. There shall be two (2) Thuemling, or equivalent, individual pressure gauge(s) installed on the pump panel. Each gauge shall be fully filled with pulse and vibration dampening Interlube to insure proper operations to minus 40 degrees and to reduce lens condensation. Each gauge shall read 0-400 PSI and shall be a minimum of 2½ inches in diameter. A removable polished, stainless steel trim ring will be provided with each gauge.			
242	**TO BE QUOTED AS AN OPTION:** Please include as an option removable hose trays for each crosslay.			
243	**Crosslay Cover:** The crosslays shall have a treadplate coated cover installed. There shall be a webbing restraint located on each end of the pre-connected crosslay/speedlay. The webbing shall be easily opened in the center with Velcro closures.			
244	**Crosslay Rollers:** Stainless steel rollers shall be provided at each end of the crosslay hose bed to facilitate deployment of hose. Vertical rollers shall be installed on each side of the hose bed opening, and a horizontal roller shall be installed under the opening.			
245	**Discharge Valves:** All discharge valves shall be quarter-turn, full flow, swing-out type. The flow regulating element of each valve shall not change its position under any condition of operation involving discharge pressures to the maximum pressure of the pump. The means to prevent a change in position shall be incorporated in the operating mechanism and shall be permitted to be manually controlled.			
246	**Location of Discharge Outlets:** No discharge outlets larger than 2½ inches shall be located on the pump operator's panel.			
247	**Stainless Steel Plumbing:** Each valve shall be individually attached to the manifold of the pump with stainless steel pipe. The plumbing to the valve shall contain a minimum of elbows to keep friction loss to a minimum and high pressure hose shall be used in as many places as practical.			

	SPECIFICATION	Meets	Does Not Meet	Comments
248	**Drain Valves:** Each discharge 2½ inches or larger, with the exception of the crosslays and hard to access plumbing, shall be equipped with a ¾ inch quarter turn Trident Emergency, or equivalent, drain between the valve and the discharge. There shall be a chrome plated rectangular handle provided on each drain valve to facilitate use with a gloved hand. Drain valves shall be located in a row just above the running board and below the pump panel on each side of the apparatus pump compartment to reduce clutter in the pump panel area. Each drain valve shall have a color coded bezel to match the appropriate line it is connected to. The drain valves shall be connected to the individual valves with flexible hose that is routed in such a manner as to assure complete drainage. Discharge from the drain valves shall be routed to below the apparatus.			
249	**Automatic Drains:** A Class 1 model 34AD, or equivalent, automatic drain shall be installed on all crosslay, deluge gun and discharge plumbing that flows in low routed areas that are located below the ¼ turn manual drain. The drains shall be located in areas where there is a possibility of back flow. These drains will open whenever pressure in the line drops below 6 PSI.			
250	**Discharge Elbows:** All discharges that are 2 inches or larger and are 42 inches or more above grade shall be equipped with a downward pointing elbow of 30 degrees or more.			
251	**Discharge Caps:** All discharges, except for those designated as preconnects, shall have a chrome cap. Caps for discharges 3½ inches and smaller shall be secured to the apparatus with suitable chains or cables.			
252	**Discharge Trim Plates:** Each gated discharge shall have a chrome plated die cast zinc trim plate around the discharge valve and fitting. The trim plate shall be easily removable without the need to disturb the valve.			
253	**Slow Close Mechanisms:** Discharges that are 3 inches or larger shall be equipped with a valve mechanism to prevent changing the position of the valve from full open to full close, or vice versa, in less than 3 seconds as required by NFPA.			

	SPECIFICATION	Meets	Does Not Meet	Comments
254	**Front Bumper 1½ Inch Discharge:** There shall be one (1) 1½ inch NST discharge installed in the bottom center of the hose tray located in the front bumper. The discharge shall be plumbed with a 2 inch Akron valve and 2 inch plumbing. Class 1 high pressure flex hose with stainless steel couplings shall be used in the plumbing of this discharge. There shall be one (1) Thuemling, or equivalent, individual pressure gauge installed on the pump panel. Each gauge shall be fully filled with pulse and vibration dampening Interlube to insure proper operations to minus 40 degrees and to reduce lens condensation. Each gauge shall read 0-400 PSI and shall be a minimum of 2½ inches in diameter. A removable polished, stainless steel trim ring will be provided with each gauge.			
255	**Left Side Discharges:** There shall be two (2) 2½ inch NST discharges on the left side of the pump compartment. The discharges shall be plumbed with 2½ inch Akron valves and 2½ inch plumbing. The 2 ½ inch valves shall be controlled by a Trident, or equivalent, quarter turn locking type push/pull control with direct linkages and universal yokes. Control rods shall be hard coated anodized aluminum ¾ inch rod and polished chrome plated zinc handles. There shall be two (2) Thuemling, or equivalent, individual pressure gauges installed on the pump panel. Each gauge shall be fully filled with pulse and vibration dampening Interlube to insure proper operations to minus 40 degrees and to reduce lens condensation. Each gauge shall read 0-400 PSI and shall be a minimum of 2½ inches in diameter. A removable polished, stainless steel trim ring will be provided with each gauge. There shall be two (2) South Park model SE394505AC, or equivalent, 2½ inch NST swivel female x 2½ inch NST male 45 degree adapters provided. The adapter shall be manufactured from high quality brass and the swivel shall be attached using ball bearings. The adapter shall be polished			

	SPECIFICATION	Meets	Does Not Meet	Comments
	to remove manufacturing irregularities with a chrome finish applied to the polished surface. There shall be two (2) 2 ½ inch NST South Park HCC2808AC, or equivalent, caps with chains provided. The cap shall be manufactured from high quality brass that shall be polished to remove manufacturing irregularities with a chrome finish applied to the polished surface.			
256	**Right Side Discharge:** There shall be one (1) 2½ inch NST discharge on the right side of the pump compartment. The discharge shall be plumbed with a 2½ inch Akron valve and 2½ inch plumbing. The 2½ inch valve shall be controlled by a Trident, or equivalent, quarter turn locking type push/pull control with direct linkage and a universal yoke. The control rod shall be hard coated anodized aluminum ¾ inch rod with a polished chrome plated zinc handle. The centerline of the valve control shall be no more than 72 inches vertically above the platform that serves as the pump operator's position. There shall be one (1) Thuemling, or equivalent, individual pressure gauge installed on the pump panel. Each gauge shall be fully filled with pulse and vibration dampening Interlube to insure proper operations to minus 40 degrees and to reduce lens condensation. Each gauge shall read 0-400 PSI and shall be a minimum of 2½ inches in diameter. A removable polished, stainless steel trim ring will be provided with each gauge. There shall be one (1) South Park model SE394505AC, or equivalent, 2½ inch NST swivel female x 2½ inch NST male 45 degree adapter provided. The adapter shall be manufactured from high quality brass and the swivel shall be attached using ball bearings. The adapter shall be polished to remove manufacturing irregularities with a chrome finish applied to the polished surface. There shall be one (1) 2½ inch NST South Park HCC2808AC, or equivalent, cap(s) with chain(s)			

	SPECIFICATION	Meets	Does Not Meet	Comments
	provided. The cap shall be manufactured from high quality brass that shall be polished to remove manufacturing irregularities with a chrome finish applied to the polished surface.			
257	**Rear Discharge:** There shall be one (1) 2½ inch NST discharge on the left side rear under the hosebed. The discharge shall be plumbed with a 2½ inch Akron valve and 2½ inch plumbing. The 2 ½ inch valve shall be controlled by a Trident, or equivalent, quarter turn locking type push/pull control with direct linkage and a universal yoke. The control rod shall be hard coated anodized aluminum ¾ inch rod with a polished chrome plated zinc handle. The centerline of the valve control shall be no more than 72 inches vertically above the platform that serves as the pump operator's position. There shall be one (1) Thuemling, or equivalent, individual pressure gauge installed on the pump panel. Each gauge shall be fully filled with pulse and vibration dampening Interlube to insure proper operations to minus 40 degrees and to reduce lens condensation. Each gauge shall read 0-400 PSI and shall be a minimum of 2½ inches in diameter. A removable polished, stainless steel trim ring will be provided with each gauge. There shall be one (1) South Park model SE394505AC, or equivalent, 2½ inch NST swivel female x 2½ inch NST male 45 degree adapter provided. The adapter shall be manufactured from high quality brass and the swivel shall be attached using ball bearings. The adapter shall be polished to remove manufacturing irregularities with a chrome finish applied to the polished surface. There shall be one (1) 2 ½ inch NST South Park HCC2808AC, or equivalent, cap(s) with chain(s) provided. The cap shall be manufactured from high quality brass that shall be polished to remove manufacturing irregularities with a chrome finish applied to the polished surface.			
258	**Large Diameter Discharge:** There shall be one (1) 4 inch NST discharge located on the right side			

	SPECIFICATION	Meets	Does Not Meet	Comments
	pump panel. The discharge shall be plumbed with a 3½ inch Akron valve and 4 inch plumbing. The 4 inch discharge shall be controlled by an Akron handwheel. The handwheel worm gear shall be connected to the remote mounted valve via a rod assembly. The handwheel shall turn a gear sector mounted on the valve for smoother and easier operations under pressure. A position indicator shall show the position of the ball valve as per NFPA 1901. Opening and closing speed shall comply with the current NFPA standard to minimize effects of water hammer. There shall be one (1) Thuemling, or equivalent, individual pressure gauge(s) installed on the pump panel. Each gauge shall be fully filled with pulse and vibration dampening Interlube to insure proper operations to minus 40 degrees and to reduce lens condensation. Each gauge shall read 0-400 PSI and shall be a minimum of 2½ inches in diameter. A removable polished, stainless steel trim ring will be provided with each gauge. There shall be one (1) Snap-Tite model AS50T40NER, or equivalent, 4 inch NST female rocker lug x 5 inch Storz, or equivalent, 30 degree elbow adapter(s) shall be supplied with the apparatus. There shall be one (1) Snap-Tite model BS50, or equivalent, 5 inch Storz, or equivalent, blind cap(s) with chain supplied with the apparatus			
259	**Foam Pro 2001 Single Foam System:** The apparatus shall be equipped with a Hypro FoamPro 2001 electronic, fully automatic, variable speed, direct injection, discharge side foam proportioning system. The system shall be capable of handling Class A foam concentrates and most Class B foam concentrates. The foam proportioning operation shall be based on direct measurement of water flows, and remain consistent within the specified flows and pressures. The system shall be capable of delivering accuracy to within 3% of calibrated settings. The system shall be equipped with a digital electronic control display, suitable for installation on the pump panel. Incorporated within the control display shall be a			

	SPECIFICATION	Meets	Does Not Meet	Comments
	microprocessor that receives input from the system flow meter, while also monitoring foam concentrate pump output, comparing values to ensure that the operator preset proportional amount of foam concentrate is injected into the discharge side of the fire pump. **(NOTE: AN OPTIONAL COMPRESSED AIR FOAM SYSTEM [CAFS] SHALL BE QUOTED ON THE RESPONSE FORM. See Attachment A for specifications.)**			
260	**Foam Proportioning System Testing:** The foam proportioning system shall be tested and certified after final installation as per NFPA 1901, newest edition.			
261	**Deluge Monitor Riser:** There shall be one (1) 3 inch riser for a deluge monitor installed above the pump on the apparatus. The riser pipe shall be installed with a 3 inch valve, controlled fro the pump operator's panel. The discharge valve shall be controlled by an Elkhart RC-10, or equivalent, slow-closing remote linear output screw-type actuator. The actuator housing and push-rod shall be constructed of light weight extruded aluminum. A precision needle thrust bearing and hardened thrust washers shall assure smooth, efficient operation and accurate flow and pressure control capability. A 5 inch cast aluminum handwheel shall allow for compact through-the-panel installation. The valve status indicator module shall provide the pump operator with the status of the valve at a glance. Red shall mean fully closed; Green shall mean fully opened; Yellow shall indicate a gated position. Incandescent lamps shall provide a reliable signal with a wide viewing angle even in bright sun light. Reliable solid state valve position sensors shall be water and lubricant resistant. The integrated circuit board and lamp sockets shall be completely encased in epoxy for total protection from the elements. The riser for the deck gun shall terminate 3 inch NPT. There shall be one (1) Thuemling, or equivalent, individual pressure gauge installed on the pump			

	SPECIFICATION	Meets	Does Not Meet	Comments
	panel. Each gauge shall be fully filled with pulse and vibration dampening Interlube to insure proper operations to minus 40 degrees and to reduce lens condensation. Each gauge shall read 0-400 PSI and shall be a minimum of 2½ inches in diameter. A removable polished, stainless steel trim ring will be provided with each gauge.			
262	**TO BE QUOTED AS AN OPTION:** Please include option of hose reel including 200' of 1" Niedner hose.			
263	**Polypropylene Foam Cell:** There shall be one (1) 30 gallon polypropylene foam cell incorporated into the polypropylene water tank. There shall be one (1) pressure/vacuum vent installed on the foam tank. There shall be one (1) drain hose connected to the foam cell. The drain shall have a ¼ turn valve installed inside the pump house and it shall drain below the frame rail of the chassis.			
264	**Water Tank:** The water tank shall have a capacity of 500 U.S. gallons. Certification of the tank capacity shall be recorded on the manufacturer's record of construction and shall be provided to the City of Grand Junction upon delivery of the apparatus.			
265	**UPF Poly Tank Construction:** The UPF Poly-Tank® IIE, or equivalent, shall be constructed of 12 inch thick PT2E™ polypropylene sheet stock. This material shall be a non-corrosive stress relieved thermoplastic, black in color, and U.V. stabilized for maximum protection.			
266	**Booster Tank:** The booster tank shall be completely independent of the body and compartments. All joints and seams shall be nitrogen welded and tested for maximum strength and integrity. The top of the booster tank shall be fitted with removable lifting eyes designed with a 3 to 1 safety factor to facilitate easy removal.			
267	**Tank Baffles:** The transverse swash partitions shall be manufactured of 3/8 inch PT2E™ polypropylene (natural in color) and extend from approximately 4 inches off the floor to just under the cover. The longitudinal swash partitions shall be constructed of 3/8 inch PT2E™ polypropylene (natural in color) and extend to the floor of the			

	SPECIFICATION	Meets	Does Not Meet	Comments
	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 shall interlock with one another and be welded to each other as well as to the walls of the tank.			
268	**Tank Sump:** There shall be one (1) sump in the bottom of the water tank. The sump shall be constructed of ½ inch polypropylene and shall be located in the left front quarter of the tank. On all tanks that require a front suction, a 4 inch schedule 40 polypropylene pipe shall be installed that will incorporate a dip tube from the front of the tank to the sump location. The sump shall be used as a combination clean-out and drain. All tanks shall have an anti-swirl plate located approximately 2 inches above the sump to pre-vent air from being entrained in the water while pumping.			
269	**Tank Fill Connection:** All tank fill couplings shall be backed with flow deflectors to break up the stream of water entering the tank, and shall be capable of withstanding sustained fill rates of up to 1,000 GPM.			
270	**Tank Lid:** The tank lid shall be constructed of ½ inch thick PT2E™ polypropylene to incorporate a multi three-piece locking design that allows for individual removal and inspection if necessary. The tank lid shall be recessed 3/8 inches from the top of the tank and shall be welded to both sides and longitudinal partitions for maximum integrity. Each one of the lids shall have hold downs consisting of 2 inch polypropylene dowels spaced a maximum of 30 inches apart. These dowels shall extend through the covers and shall assist in keeping the covers rigid under fast filling conditions. A minimum of two lifting dowels shall be drilled and tapped ½ inch x 13 inches to accommodate the lifting eyes.			
271	**Tank Mounting:** The UPF Poly-Tank IIE shall rest on the body cross members in conjunction with such additional cross members, as required by the tank manufacturer. The tank shall be isolated from the cross members through the use of hard rubber strips with, a			

	SPECIFICATION	Meets	Does Not Meet	Comments
	minimum Rockwell Hardness of 60 durometer. Additionally, the tank shall be supported around the entire perimeter and captured both front and rear as well as side to side to prevent the tank from shifting during vehicle operation. Although the tank shall be designed on a free floating suspension principle, it shall be required that the tank have adequate hold down restraints to minimize movement during vehicle operation. The tank shall be completely removable without disturbing or dismantling the apparatus structure.			
272	**Lifetime Tank Warranty:** The tank shall have a lifetime warranty from UPF.			
273	**Water Tank Fill Tower:** The tank shall have a combination vent and manual fill tower marked "Water Fill." The fill tower shall be constructed of ½ inch PT2E polypropylene and shall be a minimum dimension of 8 inches x 8 inches at the outer perimeter. The tower shall be located in the left front corner of the tank. The tower shall have a ¼ uinch thick removable polypropylene screen and a PT2E polypropylene hinged-type cover.			
274	**UPF Tank Overflow:** The tank shall be equipped with a minimum of a 4 inch schedule 40 polypropylene overflow/air vent pipe. The pipe shall be installed in the fill tower and extend through the tank and dump to the rear of the rear axle.			
275	**Tank Drain Valve:** One (1) 1½ inch tank drain valve shall be provided under the tank sump. The valve shall have a locking lever to prevent accidental draining of the tank.			
276	**Water Tank Level Gauge:** The apparatus shall be equipped with one (1) Class 1 "Intelli-Tank", or equivalent, level gauge on the pump operator's control panel. The tank level gauge shall indicate the water level on an easy to read LED display and show increments of 1/8 of a tank. The tank level gauge system shall include: 1) A pressure transducer that is mounted on the outside of the tank in an easily accessible area. 2) A super bright LED 4-light display with a visual indication at nine accurate levels. 3) A set of weather resistant connectors to			

	SPECIFICATION	Meets	Does Not Meet	Comments
	connect to the digital display, to the pressure transducer and to the apparatus power.			
277	**Control Panel:** The left side of the pump enclosure shall be divided into two sections. The lower section shall be where all valve controls, the primer control, the discharge relief valve controls (pilot valve), and other mechanical controls are located. This surface shall be referred to as the "control panel". All valve controls shall be the self-locking type, activated by either direct control or with a direct linkage utilizing friction locking bell cranks and universal ball swivels. The primary valve handles shall have color coded tags installed in a recessed area to clearly denote the purpose of each control.			
278	**TO BE QUOTED AS AN OPTION:** Please include as an option a roll up compartment door to enclose the pump control panel.			
279	**Instrument Panel:** The surface above the control panel shall contain all instruments, gauges, test fittings, and optional controls. This surface shall be referred to as the "instrument panel". The instrument panel shall be independent and hinged and latched so that it may be opened. All instruments, gauges, and other equipment shall be installed with sufficient slack in any cabling, tubing, or plumbing to allow the panel to swivel to the fully open position. The instrument and gauge panel shall be vertically hinged "swing out" to provide access for service.			
280	**Color Coded Labels:** To improve identification of discharges and intakes, color coded tags shall be provided. The tags shall utilize an etching process to provide easy visibility and improved field service life. Tags shall be affixed using an industrial grade adhesive backing, eliminating the need for pop rivets or screws into the panel or control handle.			
281	**Right Side Pump Panel:** A single panel shall be installed on the right side of the pump enclosure. This shall be the area where any right side discharges, inlets, steamers, and other pump associated equipment are located. This panel shall be easily removable and held in place with quick			

	SPECIFICATION	Meets	Does Not Meet	Comments
	release push latches. It shall be fully removable for pump and plumbing access without the need to use hand tools. Any electrical equipment that may be installed shall be equipped with connectors so they may be easily separated from the opening created when the below described front access panel is removed.			
282	**Pump Panel Lights:** The pump operator's control panel and the right side pump panel shall each be illuminated by an On Scene, or equivalent, LED night stick lighting. The pump panel lights shall become energized upon setting the parking brake so the gauge information provided may be consulted at any time the apparatus is parked. A shield shall be installed over the pump panel lights to further protect them from the elements and to act as a reflector for additional illumination.			
283	**Panel Surfaces:** The control panel, instrument panel, and right side pump panel shall be coated with a thermoplastic material for maximum resistance to abrasion and to minimize glare. The material shall be capable of withstanding the effects of extreme temperatures and weather.			
284	**Pressure/Vacuum Test Ports:** Class 1 model 115100, or equivalent, pressure and vacuum test ports shall be provided on the pump panel.			
285	**Pump Cooler Valve:** Class 1 model 38BV, or equivalent, pump cooling control valve shall be provided on the pump panel.			
286	**Engine Cooler Valve:** Class 1 model 38BV, or equivalent, pump cooling control valve shall be provided on the pump panel.			
287	**White Face/Black Numeral Gauge Display:** The master pump gauges and individual pressure gauges shall have a white face with black numbers and lettering providing a high contrast to allow the gauges to be easily read by the operator.			
288	**Master Pump Gauges:** The pump vacuum and pressure gauges shall be supplied by Thuemling, or equivalent. Each gauge shall be fully filled with pulse and vibration dampening Interlube to insure proper operation to minus 40 degrees and to reduce lens condensation. The gauge shall read -30-0-400 PSI and shall be a minimum of 4½			

	SPECIFICATION	Meets	Does Not Meet	Comments
	inches in diameter.			
289	**Dunnage Compartment:** There shall be a dunnage compartment above the pump compartment. The dunnage compartment shall be constructed of Tread Brite.			
290	**Independent Pump Compartment:** The main body and the pump compartment shall be fabricated as individual units. Both the body and pump compartment shall be fabricated using precision holding fixtures to ensure proper dimensions. All attachment points shall be heavily reinforced.			
291	**Aluminum Body Construction:** The apparatus body shall be fabricated from 1/8 inch think 5052-H32, smooth aluminum sheet. The complete apparatus body shall be fabricated utilizing the break and bend techniques in order to form a strong, yet flexible, uni-body structure. The body shall be constructed with holding fixtures to ensure proper dimensioning. The apparatus body shall be designed to meet the unique requirements as specified.			
292	**Body Sub Frame:** To assure proper body alignment and clearance, the body sub frame shall be constructed in a jig and fitted directly to the chassis. The chassis frame rails shall be fitted with fiber reinforced rubber to isolate the body frame members from direct contact with chassis frame rails. The main body sub frame shall be constructed from steel tubing. The sub frame shall run the full length of the body and shall be spaced the same width as the chassis frame rails. The main sub frame shall also be the integral support for the water tank. Vertical drop tubes shall be welded to the sub frame. From these vertical drop tubes shall extend cross members constructed of steel angle. These cross members shall extend out to support the compartments. Cross members shall be located at the front and rear of the body and in front and rear of the wheel well opening. The compartment area behind the rear axle shall			

	SPECIFICATION	Meets	Does Not Meet	Comments
	be supported by a drop frame fabricated of steel tube and steel angles. The rear drop frame shall be constructed using vertical drop tubes, welded to the main sub frame. All drop frame structures shall be welded directly to the body sub frame to allow the body to be a completely separate structure from the chassis. After fabrication the sub frame shall be hot dip galvanized for maximum protection against corrosion.			
293	**Body Mounting:** The body sub frame shall be fastened to the chassis frame with a minimum of six (6) spring loaded body mounts. Each mount shall be configured using a two-piece bracket. The two (2) brackets shall be fabricated of steel plates. The plates shall be painted to prevent any corrosion. Each mounting assembly shall utilize two (2) plated bolts and two (2) heavy duty springs. The assembly design shall allow the body and sub frame to act as one (1) component, separate from the chassis. As the chassis frame twists under driving conditions, the spring mounting system shall limit stress from being transferred into the body. The spring loaded body mounts shall also prevent frame side rail or body damage caused by unevenly distributed stress and strain due to load and chassis movement. Body mountings that do not allow relief from chassis movement shall not be acceptable.			
294	**Tank Mounting:** The water tank shall rest on the sub frame cross members which are spaced as required by the tank manufacturer. The tank shall be isolated from the cross members through the use of hard rubber strips with a minimum Rockwell hardness of 60 durometer. Additionally, the tank shall be supported around the entire perimeter and captured both front and rear as well as side to side to prevent the tank from shifting during vehicle operations. Although the tank shall be designed on a free floating suspension principle, it shall be required that the tank have adequate hold down restrains to minimize movement during vehicle operations. The tank shall be completely removable without			

	SPECIFICATION	Meets	Does Not Meet	Comments
	disturbing or dismantling the apparatus structure.			
295	**Body Storage Compartments:** Body storage compartments will have a minimum of 200 cu. ft. of storage arranged in standard fire apparatus configuration. **<u>TO BE QUOTED AS AN OPTION:</u>** Please include price comparison for roll up style doors and standard hinged compartment doors.			
296	**Compartment Lighting:** All compartments shall be furnished with an LED compartment light. The lights shall be rated at 100,000 hours of service with 74 lumens per 18 inch light. An automatic door switch shall activate all compartment lights.			
297	**Compartment Scuff Plates: S**cuff plates shall be installed in the bottom sill area of all major equipment carrying compartments to reduce paint damage from equipment. The scuff plates shall be attached using a permanent bonding double sided tape.			
298	**NFPA Step Requirements/Folding Steps:** All steps shall have a surface area of at least 35 square inches and shall be able to withstand a load of at least 500 pounds. Steps shall be adequately lighted. Each folding step shall have two large open slots to prevent buildup of ice or mud and to provide a handhold when necessary. Steps shall be provided for the following locations: • Three (3) folding steps on the left front compartment • Three (3) folding steps on the right front compartment			
299	**Right Side Pump Access Door:** There shall be a Tread Brite door above the right hand side pump panel to allow access to the pump compartment. The vertically hinged panel shall be of the single pan design and shall be positively latched in the closed position utilizing a push button latch. A gas strut shall be provided on the door. This door shall			

	SPECIFICATION	Meets	Does Not Meet	Comments
	be wired into the door ajar warning light circuit. An aluminum sill protector shall be installed on the bottom of the door opening to protect the paint from chipping and scratching.			
300	**Front Pump Access Door:** There shall be a Tread Brite access door panel provided on the front of the pump compartment. The panel shall b of the single pan design and shall be positively latched in the closed position utilizing a push button latch. An aluminum sill protector shall be installed on the bottom of the door opening to protect the paint from chipping and scratching. The area shall be accessible when the cab is tilted.			
301	**Compartment Venting:** Each body compartment shall be properly vented in a manner that will reduce the amount of dirt and water that may enter the compartment. Venting shall be directly to the atmosphere rather than into another compartment. The vent opening, which is located in the lower corner of the compartment, shall have filter which is easily removable to allow cleaning. Each compartment shall be equipped with drain holes to allow standing water to exit.			
302	**Heat Deflector Shield, Exhaust:** A deflector shield shall be provided to aid in dissipating exhaust heat from adversely affecting anything stored in the body.			
303	**Left Side Modular Running Board:** A modular running board shall be installed on the left side of the pump compartment module. The running board shall be constructed of non-slip Tread Brite. The outside edge of the running board shall be flush with the rub rail that is installed on the body to maintain a uniform appearance. All running boards shall be installed with sufficient support to form a sturdy, non-deflecting step area for personnel.			
304	**Right Side Modular Running Board:** A modular running board shall be installed on the right side of the pump compartment module. The running board shall be constructed of non-slip Tread Brite. The outside edge of the running board shall be flush with the rub rail that is installed on the body to maintain a uniform appearance. All running boards shall be installed with			

	SPECIFICATION	Meets	Does Not Meet	Comments
	sufficient support to form a sturdy, non-deflecting step area for personnel.			
305	**Modular Rear Deck:** A modular bolt-on deck shall be installed on the rear of the apparatus to form a full width step area. The rear deck shall be constructed of non-slip Tread Brite. The outside edge of the running board shall be flush with the rub rail that is installed on the body to maintain a uniform appearance. All running boards shall be installed with sufficient support to form a sturdy, non-deflecting step area for personnel.			
306	**Stainless Steel Screws:** Stainless steel screws shall be provided throughout the body in locations such as overlays, pump panels, and other numerous hardware mounting locations. Screws shall be type 410 stainless steel containing 2% molybdenum, or equivalent.			
307	**Stepping, Standing, Walking Surfaces:** All exterior surfaces designated by the manufacturer as stepping, standing or walking areas shall be constructed of grip strut or textured Tread Brite and shall provide a highly slip resistant surface, even when the surface is wet. All interior surfaces designated by the manufacturer as stepping, standing or waling areas shall be slip resistant when the surface is dry. The degree of slip resistance shall be incompliance with the intent of NFPA 1901 newest edition. The apparatus should utilize aluminum tread plate as an overlay of the main apparatus body structure. Aluminum tread plate may also be utilized in the construction of enclosure doors, lids and covers, where applicable. Aluminum tread plate is not to be utilized as a main structural member of the apparatus body or pump enclosure.			
308	**Tread Brite Overlays:** There shall be aluminum Tread Brite overlays installed on the apparatus in those areas designated as walking areas or where additional scuff protection of the apparatus finish is desired. The top Tread Brite overlay shall be mounted flush with the outer edges of the apparatus body. A			

	SPECIFICATION	Meets	Does Not Meet	Comments
	"J" channel shall be incorporated into the body design in order to provide a rain gutter to further assist in preventing excessive moisture from getting into the compartments. Overlays shall be totally insulated from the apparatus with nylon shoulder washers that extend into the hole that is drilled into the body. Stainless steel cap nuts shall be employed where bolts may damage equipment or cause injury. After painting and final construction overlays shall be additionally sealed at the edges with a caulking compound. In addition the following areas shall also be sealed with caulking compound: ·Front compartment vertical areas on both sides. ·Above the forward section of the water tank.			
309	**Rear Wheel Wells:** The fenders shall be integral with the body side and compartments with a seamless appearance. The fenders shall be fitted with bolt-in removable full circular inner lines in the wheel well area for ease of cleaning and maintenance. There shall be sufficient clearance provided in the wheel well to allow the use of tire chains when the apparatus is fully loaded.			
310	**Rear Fenderettes:** Two (2) stainless steel fenderettes shall be installed at the outboard edge of the rear wheel well area, one on each side. The fenderettes shall be bolted to the apparatus body using nylon washers to space them slightly away from the body to reduce build-up of road grime. The stainless steel fenderettes shall be polished to a high quality finish.			
311	**Road Rub Rails:** Rub rails shall be installed beneath the compartment doors to protect them from damage should the body be brushed or rubbed against another object. The rub rails shall be 3/16 inch aluminum channel, 2½ inch x 1 inch. The rub rails shall be highly polished and then bright dip anodized. Rub rails shall be installed on the body utilizing non-corrosive nylon spacers and secured with stainless steel bolts. The outside edge of the rub rails shall be even with the fenderettes and bolt-on steps to prevent snagging.			
312	**Rear Tow Hook:** One (1) rear tow hook shall be installed directly below the rear of the chassis frame rails. The tow hook shall be capable of a			

	SPECIFICATION	Meets	Does Not Meet	Comments
	15,000 lb straight pull rating.			
313	**Handrails:** All handrails, unless otherwise stated, shall be constructed of knurled aluminum of not less than 1¼ inch diameter. All railing shields and brackets shall be chrome plated, and shall be bolted to the body with stainless steel bolts. The lower bracket on all vertical handrails shall have a drain hole drilled in it at the lowest point. Location of handrails: ·Horizontal rear hand rail above the rear center compartment. ·Grab handle on top of catwalk on the left side of the apparatus in front of the tank fill tower. ·Grab handle on top of catwalk on the right side of the apparatus. ·Left rear vertical hand rail from top of body to just above the rear step.			
314	**Storage for ground ladders, back boards and long handled tools:** There will be storage to allow for convenient deployment of ground ladders: One (1) 24’ extension ladder (2 section) One (1) 14’ roof ladder One (1) 10’ folding attic ladder *Duo Safety ground ladders to be included There will be storage to allow for convenient deployment of long handled tools: One (1) 6’ D handled rubbish hook One (1) D handled Dry-wall hook One (1) 8’ Pike pole One (1) 10’ Pike pole *Hand tools to be included There will be storage to allow for convenient deployment of backboards: One (1) Standard backboard One (1) Scoop stretcher			
315	**Adjustable Shelving/Shelves:** In each compartment there shall be two (2) strut channels, one (1) per side, installed in compartments to all for maximum adjustability of shelves. There shall be one (1) adjustable shelf in each compartment constructed of 3/16 inch aluminum			

	SPECIFICATION	Meets	Does Not Meet	Comments
	sheet with 2 inch lips. The shelves shall be coated with Line-X™, or equivalent, thermoplastic polyurethane coating. The shelves shall be fabricated in such a manner that liquids readily drain when spilled.			
316	**Roll Out Equipment Tray:** There shall be one (1) roll out tray installed on the apparatus. The tray shall be provided with a SlideMaster™ model SM2-MP roller type assembly, or equivalent. The roller assembly shall have a rated capacity of 600 pound distributed load and shall have 70% extension capabilities. A mechanical lock assembly shall be provided to lock the tray in the extended position and the retracted position. The tray shall be constructed of 3/16 inch aluminum sheet with 3 inch lips. The tray shall be coated with Line-X™, or equivalent, thermoplastic polyurethane coating. The tray roller assembly shall have a powder coated finish for added corrosion protection.			
317	**Roll Out Drawers:** Compartment L1 shall contain three (3) roll out drawers built into the compartment suitable for storage of various small hand tools.			
318	**Air Bottle Compartments:** There shall be a minimum of four (4) single cylinder air bottle compartments installed in the rear wheel well area. The tubes shall be constructed from injection molded plastic to assist in preventing damage to the air cylinders. There shall be drain hole in the rear of the compartment. The single air bottle compartment shall have Cast Products, or equivalent, hinged door. All hinges and mounting hardware shall be concealed. A Southco lever latch, or equivalent, shall be utilized for opening and securely closing the door. A gasket shall be provided to keep the inside of the compartment dry.			
319	**Hose Bed Capacity:** The hose bed shall have the capacity for 600 feet of 5 inch LDH fire hose, 600 feet of 2 ½ inch double jacketed fire hose and two (2) bed of 200 feet of 1¾ inch double jacketed fire hose. Each hose bed shall be divided by adjustable dividers.			
320	**Hose Bed Flooring:** The floor of the hose bed			

	SPECIFICATION	Meets	Does Not Meet	Comments
	compartment shall be constructed of Dura-Dek, or equivalent, fiber reinforced plastic material. The flooring shall be fabricated of "T" beam pultrusions in parallel connected with cross slats that are first mechanically bonded and then epoxied, forming a large sheet. The top portion of each "T" cross section shall measure 1¼ inches wide and 3/16 inch thick with beaded ends. The vertical portion shall be 3/8 inch thick, beading out at the bottom to a thickness of ½ inch and tall enough to result in an overall height of 1 inch. The "T" sections shall be spaced ¾ inch apart to allow for drainage and ventilation. Each "T" beam shall be constructed utilizing a core of 250,000 continuous glass fiber strands that are high in resistance to tension, compression and bending. An outer sheath consisting of a continuous strand mat to prevent lineal splitting and slipping shall surround the core. The sheath shall also serve to draw the protective resin to the bar surface. Both reinforcements shall be pulled through an isophthalic polyester resin, treated with antimony trioxide for fire resistance, to form a solid length. The flooring shall then be protected with a polyurethane coating to screen out ultraviolet rays. The bright white coating shall be baked on.			
321	**Aluminum Hose Bed Partitions:** Hose bed partitions shall be installed in the hose bed. The partitions shall be fabricated from ¼ inch smooth aluminum plate and an aluminum extrusion. The partitions shall be mounted on hot-dipped galvanized slide rails at the front and rear of the hose bed. Where no obstruction such as a fill tower is present, the slide rails shall allow full movement of the partition along the width of the hose bed. Each hose bed partition shall have an oval shaped hand hold slot to assist in moving the partition. This shall provide the capability for variable hose load configurations and capacities.			
322	**Aluminum Hose Bed Cover:** There shall be a			

	SPECIFICATION	Meets	Does Not Meet	Comments
	heavy duty aluminum, tread plate cover over the hose bed. The cover will be hinged to allow for easy access and loading of hose.			
323	**Wiring Harnesses:** Wiring harnesses shall be the automotive type, engineered specifically for the builder's apparatus, and shall meet the following criteria. Under no circumstances shall diodes, resistors, or fusible links be located within the wiring harness. All such components shall be located in an easy to access wiring junction box or the main circuit breaker area. All wire shall meet white book, baseline advanced design transit coach specification and Society of Automotive Engineers recommended practices. It shall be stranded copper wire core with cross linked polyethylene insulation complying with SAE specification J1128. Each wire shall be hot stamp function coded every three inches starting one inch from the end and continuing throughout the entire harness. In addition to function coding, each wire shall be number and color coded. All terminals on the ends of the wiring harness shall be soldered unless a crimping tool or machine is used that gives an even and precise pressure for the terminal being used. All terminals shall be pull tested to insure their integrity.			
324	**Outputs:** The outputs shall perform all the following items without added modules to perform any of the tasks. 1. <u>Load Shedding:</u> The System shall have the capability to Load Shed with 8 levels any output. This means you can specify which outputs (barring NFPA restrictions) you would like Load Shed. Level 1 12.9v, Level 2 12.5V, Level 3 - 12.1V, Level 4 - 11.7V, Level 5 11.3V, Level 6 10.9V, Level 7 10.5, Level 8 10.1. Unlike conventional load shedding devices you can assign a level to any or all outputs. No add-on modules shall be acceptable; the module with the outputs must perform this function. 2. <u>Load Sequencing:</u> The System shall be able to sequence from 0 8 levels any output. With 0 being no delay and 1 being a 1 second delay, 2 being a 2 second delay and so on. Sequencing			

	SPECIFICATION	Meets	Does Not Meet	Comments
	reduces the amount of voltage spikes and drops on your vehicle, and can help limit damage to your charging system. No add-on modules shall be acceptable; the module with the outputs must perform this function. 3. Output Device: The System shall have solid-state output devices. Each solid-state output shall be a MOS-FET (Metal Oxide Semiconductor - Field Effect Transistors); MOS-FETs are solid-state devices with no moving parts to wear out. A typical relay when loaded to spec has a life of 100,000 cycles. The life of a FET is more than 100 times that of a relay. No add-on modules shall be acceptable; the module with the outputs must perform this function. 4. Flashing Outputs: The System shall be able to flash any output in either A or B phase, and logic is used to shut down needed outputs in park, or any one of several combined interlocks. The flash rate can be selected at either 80, or 160 FPM. This means any light can be specified with a multiplex truck with no need to add flashers. Flashing outputs can also be used to warn of problems or other unique idea you may come up with. No add-on modules shall be acceptable; the module with the outputs must perform this function. 5. PWM: The modules shall have the ability to PWM at some outputs so that a Headlight PWM module is not needed. No add-on modules shall be acceptable; the module with the outputs must perform this function. 6. Diagnostics: An output shall be able to detect either a short or open circuit. The System shall be able report in "real time" a text based message that points the maintenance person to a specific output.			
325	**Inputs:** 1. The inputs shall have the ability to switch by a ground or battery signal. 2. The inputs shall be filtered for noise suppression via hardware and software so that RF or dirty power will not trick an input into changing its status.			

	SPECIFICATION	Meets	Does Not Meet	Comments
326	**Automatic Climate Control:** The Multiplex system shall have the capability to provide automatic climate control which shall occur by the use of PWM outputs and a digital readout that combines other vehicle functions. The Climate control shall be an integral part of the Multiplex system. No add-on modules shall be acceptable, the module with the outputs must perform this function.			
327	**Auto-Throttle:** The Multiplex system shall be able to perform automatic high idle via a network gateway or by using an existing output on a module to provide the proper signals to an OEM Engine ECU. This task shall be handled with existing inputs and outputs. No add-on modules shall be acceptable; the module with the outputs must perform this function.			
328	**Displays:** Displays shall be able to provide real time information regarding Load Shedding and System Status, such as network traffic/errors or shorts and open circuits.			
329	**System Network:** The Multiplex system shall contain a Peer-to-Peer network. A Master Slave type network is not suitable for the Fire/Rescue industry. A Peer-to-Peer network means that all the modules are equal on the network; a Master is not needed to tell other nodes when to talk.			
330	**System Reliability:** The Multiplex system shall be able to perform in extreme temperature conditions, from 40 degrees to +85 degrees C (-40 degrees to +185 degrees F.) The system shall be sealed against the environment, moisture, humidity, salt or fluids such as diesel fuel, motor oil or brake fluid. The enclosures shall be rugged to withstand being mounted in various locations or compartments around the vehicle. The modules shall be protected from over voltage and reverse polarity.			
331	**Weatherproof Door Switches:** Due the harsh environment and susceptibility to moisture on the fire ground, the fire apparatus compartment doors shall utilize weatherproof switches. Two different types of switches shall be used. Weatherproof proximity switches shall be utilized where space permits. In tight locations, mechanical weatherproo switches shall be used. **No Exceptions.**			

	SPECIFICATION	Meets	Does Not Meet	Comments
	The switches shall be used for activation of the compartment lights and shall provide a signal to the door open circuit in the cab.			
332	**12 Volt System Schematic:** A complete electrical schematic for the apparatus shall be provided. This schematic shall be specifically prepared for this individual unit rather than a generic schematic designed to accommodate all apparatus.			
333	**12 Volt System Test:** After completion of the unit, the 12 volt electrical system shall undergo a battery of tests as listed in the latest addition of NFPA Pamphlet 1901. These tests shall include, but not be limited to: a reserve capacity test, alternator performance test at idle, alternator performance test at full load, and a low voltage alarm test. Certification of the results shall be supplied with the apparatus at the time of delivery.			
334	**Rear Work Light Switch:** A switch shall be installed above the tail light bezel on the left side. The switch shall be wired to the backup lights to provide additional work lighting. The rear work light circuit shall be deactivated when the park brake is disengaged. In addition to the lights being activated by the above switch, the lights shall also come on when the transmission is placed in reverse.			
335	**Midship Turn Signals:** There shall be one (1) Truck-Lite model 21, or equivalent, LED midship auxiliary/turn signal lights installed in the rub rail, on each side of the body.			
336	**Clearance Lights:** Grote model 65282, or equivalent, red LED clearance lights shall be installed on the rear of the body as necessary to be in full compliance with applicable ICC and DOT codes and regulations.			
337	**Ground Lighting:** Truck-Lite model 40, or equivalent, lights shall be installed beneath the apparatus in areas where personnel may be expected to climb on and off the apparatus. The lights shall illuminate the ground within 30 inches of the apparatus to provide visibility of an obstructions or hazards. These areas shall include, but not be limited to, side running boards and the rear step area.			
338	**Walkway Lights:** Lights shall be mounted in a manner that illuminates all walkways and steps for			

	SPECIFICATION	Meets	Does Not Meet	Comments
	safe operation of the apparatus. These lights shall become illuminated when the parking brake is engaged.			
339	**Firecom 3010 Intercom:** There shall be a Firecom 3010 intercom system provided on the apparatus. The system shall include six (6) positions in the cab, and one (1) at the pump panel. Each position in the system shall have intercom capabilities. The following positions shall have radio interface capabilities: Driver, Officer, and Pump Panel. There shall be two (2) Firecom model UH-10, part number 105-0192-00 under the helmet, radio transmit headsets included with the intercom system. The headset shall include, volume control, a noise canceling microphone, adjustable head strap, flex boom microphone, liquid foam ear seals, and a red push to talk button. There shall be four (4) Firecom model UH-20, part number 105-0193-00 under the helmet, intercom only headset(s) included with the intercom system. The headset shall include, volume control, a noise canceling microphone, adjustable head strap, flex boom microphone, liquid foam ear seals, and a momentary push and hold to talk button. There shall be one (1) Firecom model HE-150, part number 108-0675-15, 15 foot coiled extension cable(s) supplied. The cable shall be compatible with any single plug Firecom headset. There shall be six (6) Firecom HM-10, headset plug-in modules, part number 107-0407-00 installed. The modules are designed for interior mounting and shall accommodate a Firecom single plug headset. There shall be one (1) Firecom model PP-20, part number 107-0413-00, waterproof headset module installed. The module shall have a snap tight spring hinged lid to protect against moisture and allow for exterior mounting. The module shall be designed to accommodate Firecom single plug headsets.			

	SPECIFICATION	Meets	Does Not Meet	Comments
340	**Mobile Radio Interface Cable, Firecom:** There shall be a Firecom mobile interface cable provided with the intercom system. The cable is radio specific and will allow the Firecom intercom system to interface with the mobile radio system. The mobile radios being used are Motorola XTL-2500.			
341	**Pump Compartment Lights:** There shall be two (2) LED lights installed in the pump compartment. The lights shall be activated by an automatic switch in the right side pump compartment access door and shall be located in a manner that will provide maximum lighting.			
342	**Tail Lights:** There shall be a Whelen 600 series, or equivalent, LED tail light assembly installed on each side of the rear of the apparatus. Each assembly shall include one (1) red LED stop/tail light model number 60R00BRR, one (1) amber LED model 60A00TAR turn light with arrow and one (1) clear halogen backup light model 60F000CR. The lights shall be mounted in a chrome plated composite housing.			
343	**Streamlight Rechargeable Lights:** There shall be two (2) Streamlight model 45102 20 watt spot, rechargeable LiteBoxes supplied and installed on the apparatus. The lights shall be wired direct to the chassis batteries			
344	**Customer Supplied Radio and Antenna:** There shall be one (1) City supplied radio and one (1) City supplied antenna shipped to the apparatus manufacturer for installation.			
345	**Onan Hydraulic Generator Set:** An Onan model 8RBAB hydraulic driven generator set shall be installed on the apparatus. The generator shall be rated at 8,000 watts at 120/240 volts. Current frequency shall be stable at 60 hertz. The power generating unit shall be modular unit, housed in stainless steel with an acoustical material added for maximum sound dampening. The module shall consist of the hydraulic motor, generator, blower, cooler, and all other necessary components. For ease of maintenance, the only part of the system that shall require accessibility shall be the oil reservoir which shall be located so as to facilitate periodic checks and the adding of hydraulic fluids.			
346	**Warranty Period:** Onan shall warrant that the			

	SPECIFICATION	Meets	Does Not Meet	Comments
	8RBAB series hydraulic generators shall be free from defects in material and workmanship for a period of five (5) years or one thousand (1,000) hours, whichever comes first, from the date of delivery. A ninety (90) day adjustment policy shall be free of charge. This policy provides that Cummins Inc. will make minor adjustments to the generator set during the first three (3) months of ownership. In addition to the five (5) year or one thousand (1,000) hour warranty, a travel time repair allowance of 2-1/2 hours and mileage cost up to one hundred (100) miles shall be included for the first two (2) years			
347	**Generator Hot Shift PTO Connection:** The hydraulic pump for the generator system shall be connected to the chassis transmission through a "Hot Shift", electrically engaged power-take-off system. The control to engage and disengage the power-take-off system shall be installed in the chassis cab.			
348	**Generator Display Meter:** There shall be an LED generator display meter provided with the generator. The display meter shall automatically sense a generator signal and begin displaying information. The digital meter display shall constantly monitor and display voltage, frequency and amps. The display shall be capable of displaying total accumulated run time hours when the MODE button is pressed once. When the MODE button is pressed twice the display shall show the temperature of the oil returning to the oil reservoir. The frog display shall be located on the pump panel.			
349	**Load Center:** The entire 120/240 volt electrical system shall be installed in strict compliance with NFPA Pamphlet 1901 newest edition. This shall include all testing, labeling, wiring methodology, and dimensional requirements. Certification of compliance shall accompany the apparatus at the time of delivery. There shall be a 120/240 volt load center incorporated into the 120/240 volt wiring system. The load center shall include			

	SPECIFICATION	Meets	Does Not Meet	Comments
	adequate circuit breakers to protect the loads specified on this apparatus. All 120/240 volt A.C. wiring shall be done in accordance with NFPA Pamphlet 1901 as well as nationally accepted electrical codes.			
350	**Branch Circuit Over Current Protection:** Over current protection devices shall be provided for circuits in accordance with NFPA 1901 newest version. The load center shall be equipped with a non-GFI two pole main breaker when the six (6) or more individual branch circuits are present. Over current protection devices shall be marked with labels to identify the function of the circuit they protect.			
351	**Protective Covers and Enclosures for Electrical Terminals:** All ungrounded electrical terminals shall have a protective cove or be in an enclosure.			
352	**120 Volt Twist Lock Receptacles:** There shall be two (2) NEMA L5-20 120 volt 20 ampere rating twist lock type receptacles wired to the generator. The receptacles shall have spring loaded weather resistant covers.			
353	**Rear Cab Wall Telescoping Light Mounts:** The following 240 volt telescoping lights shall be mounted to the rear of the cab: **Telescoping 240 Volt Lights:** There shall be Two (2) Fire Research NightMaster model LTA510-M12 telescopic lights installed. The light poles shall be anodized aluminum and have a knurled twist lock mechanism to secure the extension pole in position. The lamphead shall have one (1) quartz halogen 1000 watt 240 volt bulb. The bulb shall draw 4.2 amps and generate 22,000 lumens. The bulb shall be accessible through the front. The lamphead angle of elevation shall be adjustable at a pivot in the mounting arm and the position locked with a star shaped locking knob. The lamphead shall be no more than 5 3/8 inches deep by 10 ½ inches high by 16 ½ inches wide. Lamphead and mounting arm shall be powder coated white. The floodlight shall be UL listed as a scene light for fire service use. The above 240 volt light shall be controlled with the circuit breaker.			

	SPECIFICATION	Meets	Does Not Meet	Comments
354	**Mounted Portable Halogen Work Lights:** There shall be two (2) halogen work lights mounted to the top of the apparatus at the rear (one each side). The lights shall be equipped so they can be activated from inside the cab for scene lighting and can also be unplugged and removed for use with the cord reel or other electrical receptacles.			
355	**Electric Cord Reel:** There shall be one (1) 120 volt electric rewind cord reel installed on the apparatus with a rewind button installed for 12 volt rewinding of the cord reel. The reels shall be equipped with 20 feet of cord installed with a cable stop to prevent damage to cable. Rollers shall be supplied to prevent damage to electrical cable if pulled in any direction. The cord reel shall be located as determined at the pre-construction meeting.			
356	**Power strip outlets:** Two (2) multi outlet power strips for running and charging various electrical devices in cab to be placed by customer during preconstruction meeting. Two (2) multi outlet power strips for running and charging various electrical devices in body storage compartments to be placed by customer during preconstruction meeting.			
357	**WiFi hotspot:** Wifi hotspot installed in cab.			
358	**Cord Reel Junction Box:** There shall be one (1) electrical junction box equipped with four (4) electrical receptacles mounted to the cord reel. Each receptacle shall be twist lock type and equipped with a spring loaded snap cover. The cord reel shall be prewired to the junction box to supply power to the four receptacles. Each side of the junction box shall be fitted with faceplates which are back lighted so that plug orientation to the receptacles is quick and easy to align. Junction box mounting shall be located as determined at the pre-construction meeting			
359	**Deutsch Plugs on Warning Lights:** All warning lights shall be supplied with Deutsch plugs connectors.			
360	**Upper Zone A Visual Warning:** There shall be			

	SPECIFICATION	Meets	Does Not Meet	Comments
	one (1) custom length 82 inch light bar installed on the chassis cab roof with Whelen Engineering model FN72VLED, or equivalent, and part number 9LLTH82, or equivalent, added to make the total length 82 inches. The light bar shall be equipped with two (2) forward facing linear "Red" LED's, two (2) forward facing linear "White" LED's, two (2) corner forward facing "Red" LED's, and two (2) corner rear facing "Red" LED's. The light bars shall be equipped with clear lenses. All clear LEDs in the light bar shall be deactivated in the Blocking Right of Way mode.			
361	**Opticom Emitter:** There shall be one (1) low profile LED Opticom emitter located in the light bar. The emitter shall be have a performance range of up to 2,500 feet to provide preemption of all intersections equipped with the Opticom infrared system. The emitter shall be wired in such a manner as to be disabled when the park brake is set. A switch in the main switch panel shall control the unit in conjunction with the park brake circuit.			
362	**Upper Zone C Visual Warning:** There shall be two (2) Whelen Engineering model MCFLED2R Micro Edge, or equivalent, LED lights installed high at the rear of the apparatus. The lights shall have red lenses.			
363	**Lower Zone B Visual Warning:** There shall be one (1) Whelen Engineering model 60R02FRR, or equivalent, super LED lights with flanges installed in the lower warning zone. The lights shall be red with red lenses.			
364	**Lower Zone C Visual Warning:** There shall be two (2) Whelen Engineering model 60R02FRR, or equivalent, super LED lights with flanges installed in the lower warning zone. The lights shall be red with red lenses.			
365	**Lower Zone D Visual Warning:** There shall be one (1) Whelen Engineering model 60R02FRR, or equivalent, super LED lights with flanges installed in the lower warning zone. The lights shall be red with red lenses.			
366	**Thermoplastic Coating:** In the designated areas (found in item 372 below) Line-X™, or an			

	SPECIFICATION	Meets	Does Not Meet	Comments
	equivalent two component spray-in-place thermoplastic polyurethane system, shall be used for maximum protection of the body and equipment. The system shall utilize flexible 100% solids applied with high pressure impingement-mix polyurethane dispensing equipment. The coating shall be a fast cure, textured surface, multi-purpose material designed for commercial and industrial applications. It shall exhibit excellent adhesion to the body and serve as a protective, abrasion resistant liner where applied. The density of the material shall be a minimum of 70 PCF as measured using ASTM test method D-1622. The taber abrasion resistance shall be a minimum of 0.03% per 1000 cycles as measured utilizing ASTM test method D-4060. The minimum tensile strength as measured using ASTM D-2370 shall be 1540 pounds per square inch			
367	**Body Compartmentation Coating:** The interior of the body compartments shall be coated with a gray thermo-plastic polyurethane coating. The coating shall be durable enough to withstand every day abuse of equipment removal and shifting.			
368	**Body Paint Preparation:** After the body and components have been fabricated and assembled they shall then be disassembled prior to painting so when the apparatus is completed there shall be finish paint beneath the removable components. The body shall be totally removed from the chassis during the painting process to insure the entire unit is covered. The apparatus body and components shall be metal finished as follows to provide a superior substrate for painting. All aluminum sections of the body shall undergo a thorough cleaning process starting with a phosphoric acid solution to begin the etching process followed by a complete rinse. A chemical conversion coating shall be applied to seal the metal substrate and become part of the aluminum surface for greater film adhesion. After the cleaning process the body and its components shall be primed with a High Solids primer and the seams shall be caulked.			

	SPECIFICATION	Meets	Does Not Meet	Comments
	All bright metal fittings, if unavailable in stainless steel or polished aluminum, shall be heavily chrome plated. Iron fittings shall be copper underplated prior to chrome plating.			
369	**Paint Process:** The paint process shall follow the strict standards as set forth by PPG Fleet Finish Guidelines. The body shall go through a three-stage paint process: primer coat, base coat (color), and clear coat. In the first stage of the paint process the body shall be coated with PPG F3980 Low VOC / High Solids primer to achieve a total thickness of 2-4 mills. In the second stage of the paint process the body shall be painted with PPG FBCH Delfleet™ High Solids Polyurethane Base Coat. A minimum of two to three coats of paint shall be applied to achieve hiding. In the final stage of the paint process the body shall be painted with PPG DCU-2002 Clear Coat. A minimum of two to three coats shall be applied to achieve a total dry film thickness of 2-3 mills. As part of the curing process the painted body shall go through a Force Dry / Bake Cycle process. The painted components shall be baked at 185 degrees for 3 hours to achieve a complete coating cure on the finished product.			
370	**Hand Polished:** After the force dry / bake cycle and ample cool down time, the coated surface shall be sanded using 3M 1000, 1200, and or 1500 grit sandpaper to remove surface defects. In the final step, the surface shall be buffed with 3M super duty compound to add extra shine to coated surface. No more than .5 mil of clear shall be removed in this process.			
371	**Apparatus Body Color:** The apparatus shall be painted with PPG High Solids Polyurethane Base Coat. The apparatus shall be painted (RED) PPG #FBCH - 71096-ALT.			
372	**Touch Up Paint:** One (1) two ounce bottle of acrylic enamel touch up paint or two (2) touch up paint pens, if color is available, shall be supplied.			
373	**NFPA Compliant Reflective Striping:** Reflective striping shall be applied to the exterior of the apparatus in a manner consistent with the National			

	SPECIFICATION	Meets	Does Not Meet	Comments
	Fire Protection Associate Pamphlet 1901, latest edition. It shall consist of a straight, 6 inch wide stripe along the front of the chassis and along the sides, staying below the tops of the wheel well areas. The reflective striping shall be white in color			
374	**Chevron Reflective Striping:** In addition to the custom striping pattern supplied on the apparatus, there shall be additional reflective striping applied to the entire rear of the unit. The reflective striping shall cover at least 50% of the rear facing vertical surface, per NFPA 1901 newest edition. The striping shall consist of alternating red and yellow, fluorescent yellow or fluorescent yellow-green reflective stripes. Each stripe shall be a minimum of inches wide and shall be applied to the apparatus at 45 degree angle. The chevron striping shall consist of 3M part numbers 1172 EC, red and 3983, fluorescent yellow-green.			
375	**Rub Rail Reflective Striping:** There shall be 2 inch reflective striping installed in the rub rail channel. The reflective striping shall be diamond grade quality material for increase visibility. The reflective shall be silver in color.			
376	**Undercoating:** The apparatus shall undergo a two (2) step undercoating process. The first step shall be a rubberized polyurethane base compound that is applied after the body has been primed. The materials used shall incorporate unused paint products to reduce the amount of waste released into the environment. This coat shall be applied to all hidden pockets and surfaces that shall not be visible after completion. As a final step, the entire underside of the body shall be coated with a bituminous based automotive type undercoating when the apparatus is completed. During this application, special care shall be taken to avoid spraying the product on air lines, cables, or other items that would cause normal maintenance to be hindered.			
377	**Mud Flaps (4):** There shall be two (2) mud flaps at the front of the chassis and two (2) at the rear of the unit. The mud flaps shall be a minimum of 3/8 inch thick to prevent "sailing".			
378	**Wheel Chocks and Mounting:** There shall be one			

	SPECIFICATION	Meets	Does Not Meet	Comments
	(1) pair of Cast Products Inc., or equivalent, wheel chocks provided with the apparatus. The chocks shall be mounted in brackets that are easily accessible under the left side body.			
379	**Additional Hardware:** Hand lantern (Stream Light) charging stations, Computer docking station, Mobile radio and other standard equipment will be mounted at the factory. The customer will locate these items during the pre-construction meeting.			
380	**Helmet Brackets, OEM Supplied:** The apparatus manufacturer shall supply brackets for mounting helmets in the chassis cab. These brackets shall comply with NFPA 1901, newest edition, and shall meet the 9G requirements. The Zico model UHH-1 brackets shall hold both traditional and contemporary style helmets without any adjustments necessary. Storing and removing a helmet that is on the bracket shall be quick and easy.			
381	**Fuel Fill:** The fuel fill pocket shall be located in the left rear wheel well area. The fuel fill shall have a Cast Products, or equivalent, aluminum door with bezel installed.			
382	**Fuel Tank Gauge Access Panel:** There shall be a removable panel provided in the rear compartment to allow for access to the fuel tank gauge without removing the fuel tank.			
383	**Manufacturing Labels:** A permanent plate shall be mounted in the driver's compartment specifying the quantity and type of the following fluids that may be used in the apparatus for normal maintenance. Where a fluid is not applicable to the unit, the plate shall be marked N/A to inform the service technician who may not be familiar with the apparatus. •Engine oil •Engine coolant •Transmission fluid •Pump transmission fluid •Pump primer fluid •Drive axle fluid •Air conditioning refrigerant •Power steering fluid •Cab tilt mechanism fluid •Transfer case fluid •Equipment rack fluid •Air compressor system lubricant			

	SPECIFICATION	Meets	Does Not Meet	Comments
	•Generator system lubricant •Front tires air pressure •Rear tires air pressure A permanent plate shall be affixed in the driver's area that states the maximum number of personnel allowed to ride on the apparatus at any time. A sign shall be affixed in the chassis cab, in plain sight of the driver that states the overall travel height, overall length, and gross GVWR of the apparatus. On any gated inlet on the apparatus, a permanent label shall be provided that states: "WARNING: Death or serious injury might occur if proper operating procedures are not followed. The pump operator as well as individuals connecting supply or discharges hoses to the apparatus must be familiar with water hydraulics hazards and component limitations." All other appropriate labels to ensure safe operation of the apparatus shall be permanently affixed in conspicuous locations.			
384	**Striping and lettering:** Department lettering and striping will be completed at the factory. Design specifications will be completed at, or prior to, the Pre-Construction meeting.			
385	**Pre-Construction Meeting:** There shall be a pre-construction meeting held at the factory. The pre-construction meeting is the most important meeting during the after-award process. The purpose of this meeting is to finalize all aspects of the specifications, discuss and clarify all design details and to share or provide all information so all parties are in agreement on the apparatus being constructed. The ultimate goal of the pre-construction meeting is for the City and the dealer representative to discuss and clarify all aspects of the proposed apparatus and to provide all necessary information to the apparatus manufacturer that shall ensure the apparatus is built to the satisfaction of all parties involved.			

	SPECIFICATION	Meets	Does Not Meet	Comments
	The apparatus manufacturer shall create and forward to the dealer a "Pre-construction" binder containing the following items: •Complete Specifications including the Body, Chassis and Aerial (if applicable). •Detailed Amp Draw Report •A listing of clarifications or questions from the manufacturer that require attention, such as shelf locations, lettering details, etc. •Full Size "C" Drawings, minimum of five (5) •11" x 17" Drawing •Paint Sample Plates for color matching of existing apparatus •Paint Confirmation form During this pre-construction meeting, any changes or clarifications must be documented on a manufacturer issued change order. The change order shall be signed by the City and Dealership and ultimately by the apparatus manufacturer. The change order officially becomes an extension of the contract upon official signatures of all three parties. All change order items resulting from the pre-construction meeting shall be implemented into the official shop order document. The pre-construction meeting will include two (2) representatives from the City of Grand Junction.			
386	**Pre-Paint Inspection:** There shall be an inspection of the apparatus in the pre-paint stage of production by the City. The City shall be given the opportunity to visually inspect the chassis, pump panel, plumbing, and all other body options so that any discrepancies may be addressed prior to the painting process. A factory representative shall be present at the inspection to answer all questions. The manufacturer shall give adequate notice to the dealer as to when the apparatus shall be available for inspection. The pre-paint inspection will include two (2) representatives from the City of Grand Junction.			
387	**Final Inspection:** There shall be an inspection of the apparatus in the final stage of production. The City shall be given the opportunity to visually inspect the completed apparatus including the chassis, pump panel, plumbing and all other body			

	SPECIFICATION	Meets	Does Not Meet	Comments
	options so that any discrepancies may be addressed prior to the apparatus leaving the factory. A factory representative shall be present at the inspection to answer all questions. The manufacturer shall give adequate and accurate notice to the dealer as to the date the apparatus shall be completed. If any discrepancies are found during the final inspection, they shall be addressed immediately. At that point the manufacturer shall provide a firm delivery date. The final inspection will include two (2) representatives from the City of Grand Junction.			
388	**Delivery and Demonstration:** Delivery of the completed apparatus to 333 West Avenue, Bldg C, Grand Junction, CO shall be provided. On initial delivery of the fire apparatus, a qualified representative shall demonstrate the apparatus and provide initial instruction to representatives of the City regarding the operation, care and maintenance of the apparatus and equipment supplied at the City's location. The delivery and instruction schedule shall be determined by the delivery engineer/ representative and the City.			

SECTION V. PROPOSAL FORM

The Owner will receive electronic bids through the Rocky Mountain E-Purchasing website, www.bidnetdirect.com/colorado prior to the date and time indicated on the front of this document at which time the bids will be publicly opened and read, for furnishing the materials, supplies, equipment and/or services, as shown below and/or attached hereto: **FOB DESTINATION** delivered to Fleet Services, 333 West Avenue, Bldg C, Grand Junction, Colorado 81501. **TRANSPORTATION CHARGES PREPAID.** All in accordance with the bid conditions, special provisions, and specifications attached or as indicated below.

Purchasing Representative: Susan Hyatt susanh@gjcity.org 970-244-1513

Net price for One (1), New or Demo Model, Fire Engine Pumper $_____

Price Extended for Two $_____

Written: _____Dollars

Year/Manufacture/Model No.: _____

SPECIFY OVERALL HEIGHT WITH PROPERLY INFLATED TIRES (ITEM 7) _____ **INCHES**
SPECIFY TOP SPEED OF UNIT (ITEM 8) _____ **MPH**
SPECIFY OVERALL LENGTH OF UNIT (ITEM 9) _____ **INCHES**

DELIVERY: State expected delivery time after receipt of order. _____ days ARO

Order Cutoff Date (Please specify the order cutoff date if any): _____

WARRANTY: Specify Warranty and supply manufacturer's documentation:

_____

OPTIONAL ITEMS:

1. CNG Engine with 60 DGE Fuel Tank (Item 28) $_____

2. Detroit Brand Diesel Engine (Item 29) $_____

3. Clean Cab Design replacing 1 forward facing seat with enclosed cabinet (Item 149)
$_____

4. 10 Inch Extended Cab with In-Cab Roll Up Storage Cabinets (Item 150)
$_____

5. Door Locks, Power Locks (Item 154) $_____

6. Other pump configuration, PUC or equivalent designs (Item 206) $_____

7. Removable hose trays for each crosslay (Item 242) $_____

8. Optional CAFS (Item 259) – Specs in Attachment A $_____

9. Hose reel including 200' of 1" Niedner hose (Item 262) $_____

10. Roll Up compartment door for pump control panel (Item 278) $_____

11. A. Roll Up style door (Item 295) $_____

B. Standard hinged compartment doors (Item 295) $_____

ADDENDA: State number of Addenda received: _____.

DATE_____

- Prompt payment discount of _____percent of the net dollar amount will be offered to the City if the invoice is paid within _____ days after the receipt of the invoice.
- The undersigned certifies and agrees that this Proposal is submitted in accordance with all applicable Federal, State, County, and City laws.
- The undersigned certifies that no Federal, State, County or Municipal tax will be added to the above quoted prices.

_____
(Company Name of Bidder – Typed or Printed)

_____
(Phone Number of Bidder)

_____
(Address of Bidder)

_____
(Authorized Dealer Agent – Typed or Printed)

_____
(City, State, and Zip Code)

_____
(Authorized Signature)

_____
(E-mail Address of Agent or Sales Contact)

ATTACHMENT A

OPTIONAL ITEM 259: COMPRESSED AIR FOAM SYSTEM (CAFS):

HUSKY 12 FOAM SYSTEM: A Pierce Husky 12 foam proportioning system shall be provided that is an on demand, automatic proportioning, single point, direct injection system suitable for all types of Class "A" & "B" foam concentrates, including the high viscosity (6000 cps), alcohol resistant Class B foams. Operation will be based on direct measurement of water flow, and remain consistent within the specified flows and pressures. The system will automatically balance and proportion foam solution at rates from 0.1% to 9.9% regardless of variations in water pressure and flow, up to the maximum rated capacity of the foam concentrate pump.

The design of the system will allow operation from draft, hydrant, or relay operation. This will provide a versatile system to meet the demands at a fire.

1. System Capacity: The system will have the ability to deliver the following minimum foam solution flow rates at accuracies that meet or exceed NFPA requirements at a pump rating of 250 PSI.

200 GPM @ 6%
400 GPM @ 3%
1200 GPM @ 1%

Class A foam setting in .1 % increments from .1% to 1%. Typical settings of 1%, .5% and .3% (Maximum capacity will be limited to the plumbing and water pump capacity)

2. Control System: The system will be equipped with a digital electronic control display located on the pump operators panel. Push button controls will be integrated into the panel to turn the system on/off, control the foam percentage, direct which foam to use on a multi-tank system, and to set the operation modes (automatic, manual, draft, calibration, or flush).

The percent of injection will have presets for class A and class B foam. These presets can be changed at the fire department as desired. The percent of injection will be able to be easily changed at the scene to adjust to changing demands.

In order to minimize the use of abbreviations and interpretations, system information will be displayed on the panel by way of .50 tall LEDs that total fourteen characters (two lines of 7 each). System on and foam pump on indicator lights will also be included. Information displayed will include mode of operation (automatic, manual, draft, calibration, or flush), foam supply selected (Class A or Class B), water total, foam total, foam percentage, remaining gallons, and time remaining.

The control display will direct a microprocessor, which receives input from the systems water flow meter while also monitoring the position of the foam concentrate pump. The microprocessor will compare the values of the water flow versus the position/rate of the foam pump, to ensure the proportion rate is accurate. One (1) check valve will be installed in the plumbing to prevent foam from contaminating the water pump.

3. Low Level, Foam Tank: The control head will display a warning message when the foam tank in use is below a quarter tank.

4. Hydraulic Drive System: The foam concentrate pump will be powered by a hydraulic drive system, which is automatically activated, whenever the vehicle water pump is engaged. A system that drives the foam pump via an electric motor will not be acceptable. A large parasitic electric load used to power the foam pump can cause an overload of the chassis electrical system.

Hydraulic oil cooler will be provided to automatically prevent overheating of the hydraulic oil, which is detrimental to system components. The oil/water cooler will be designed to allow continuous system operation without allowing hydraulic oil temperature to exceed the oil specifications.

The hydraulic oil reservoir will be of four (4) gallons minimum capacity and will also be of sufficient size to minimize foaming and be located to facilitate checking oil level or adding oil without spillage or the need to remove access panels.

5. Foam Concentrate Pump: The foam concentrate pump will be of positive displacement, self-priming; linear actuated design, driven by the hydraulic motor. The pump will be constructed of brass body; chrome plated stainless steel shaft, with a stainless steel piston. In order to increase longevity of the pump, no aluminum will be present in its construction.

A relief system will be provided which is designed to protect the drive system components and prevent over pressuring the foam concentrate pump

The foam concentrate pump will have minimum capacity for 12 gpm with all types of foam concentrates with a viscosity at or below 6000 cps including protein, fluoroprotein, AFFF, FFFP, or AR-AFFF. The system will deliver only the amount of foam concentrate flow required, without recirculating foam back to the storage tank. Recirculating foam concentrate back to the storage tank can cause agitation and premature foaming of the concentrate, which can result in system failure. The foam concentrate pump will be self-priming and have the ability to draw foam concentrate from external supplies such as drums or pails.

6. External Foam Concentrate Connection: An external foam pick-up will be provided to enable use of a foam agent that is not stored on the vehicle. The external foam pick-up will be designed to allow continued operation after the on-board foam tank is empty. The external foam pick-up will be designed to allow use with training foam or colored water for training purposes.

7. Panel Mounted Strainer / External Pick-Up Connection: A bronze body strainer / connector unit will be provided. The unit will be mounted to the pump panel. The external foam pick-up will be one (1) - 1.00" male connection with chrome-plated cap integrated to a 2.00” strainer cleanout cap. A check valve will be installed in the pick-up portion of the cleanout cap. A basket style stainless steel screen will be installed in the body of the strainer / connector unit. Removal of the 2.00” cleanout cap will be all that is required to gain access to and remove the stainless steel basket screen. The strainer / connector unit will be ahead of the foam concentrate pump inlet port to insure that all agents reaching the foam pump has been strained.

8. Pick-Up Hose: A 1.00" flexible hose with an end for insertion into foam containers will be provided. The hose will be supplied with a 1.00" female swivel NST thread swivel connector. The hose will be shipped loose.

9. Discharges: The foam system will be plumbed to six discharges. The discharges capable of dispensing foam will be same as CAFS System.

10. Automatic tank fill: A two and one half inch (2 ½") Automatic tank fill will be included on the right side.

11. System Electrical Load: The foam proportioning will not impose an electrical load on the vehicle electrical system any greater than five (5) amps at 12VDC.

12. Tank Selector: An electric valve will be used for the foam supply valve. The foam supply valve will be controlled at the foam system control head for ease of operation. The supply valve will be electric, remote controlled, to eliminate air pockets in the foam tank supply hose.

13. Maintenance Message: A message will be displayed on the control head to advise when system maintenance needs to be performed. The message will display interval for cleaning the foam strainer, cleaning for the water strainers, and changing the hydraulic oil.

14. Flush System: The system will be designed such that a flush mode will be provided to allow the system to flush all foam concentrate with clear water. The flush circuit control logic will ensure the foam tank supply valve is closed prior to opening the flush valve. The flush valve will be operated at the foam system control head for ease of operation. The valve will be electrically controlled and located as close to the foam tank supply valve as possible. A manual flush drain valve will be labeled and located under the driver's side running board.

15. Foam Generating System, CAF: A Pierce Hercules® system rated to provide 200 cfm capacity for generating compressed air foam will be provided. The system will supply six (6) discharges with compressed air foam. It will be capable of providing foam solution or compressed air foam from any of the specified CAFS discharges simultaneously. In addition, the consistency of the compressed air foam (wet to dry) from each discharge will be adjustable. All CAF capable discharges will have the discharge valve control, air injection control, and discharge pressure gauge mounted in a group on the operator's panel. Each CAF capable discharge will feature a wafer type check valve to prevent reverse flows of compressed air foam that is integrated into the discharge valve. The wafer check valve will be a type and design approved by the manufacturer of the discharge valve.

16. Discharges to CAF Capable: The front bumper discharge, the 2.50" discharge in rear, the deck gun, and all crosslays discharges will be capable of discharging compressed air foam. There is no second pump on the vehicle

17. Air Compressor: A Pierce Hercules® oil flooded rotary screw compressor rated at 200cfm @ 150psig will be provided. The compressor will be mounted between the chassis frame rails. The compressor will be driven by the vehicle transmission through a clutch type PTO. All components of the system will be sized and rated for the system to deliver

compressed air, uninterrupted, for up to 2 hours at a time without undue stresses, vibrations, or overheating. The air compressor will be capable of delivering the rated capacity of the compressor when the fire pump is delivering 400gpm @150psi from tank or draft.

All components of the air compressor system will be readily available on the domestic air compressor market (USA). The compressor will be designed and assembled by Pierce Manufacturing using standard components available to air compressor OEM's.

The PTO will be a 10 bolt SAE type mounted to the PTO opening of the vehicle's Allison transmission. The PTO will be rated for at least 20 percent more torque throughput than the air compressor will demand.

The air/oil separator for the compressor system will be easily serviced. The separator will be inside the air/oil receiver tank. The separator will consist of two stages. The first stage being a centrifuge arrangement engineered into the tank. The second stage will be a dual cartridge arrangement featuring an "inside to outside" flow of the air through the cartridges. The separation system will be capable of a 250 SCFM flow at 40 psi tank pressure. The allowable oil carry over will be no more than 10 parts per million oil in air.

A steel air/oil receiver tank will be provided. The tank will be constructed and tested to the applicable standards as addressed by NFPA 1901 for CAF system air compressor tanks. The tank will be mounted in a manner that allows easy access to the fill opening and the level sight gauges. The tank will be of the vertical type with the minimum pressure valve of the compressor system integrated into the top of the tank. The minimum pressure valve will be rotatable to facilitate different discharge arrangements from the tank.

The compressor lubricant will be filtered by cartridge type filter. The filter will have a 25 micron rating and a safety bypass valve. The filter assembly will be mounted and located in a manner that allows easy service. A thermostat valve will be integrated into the oil filter assembly's housing. The thermostat will route lubricant to the oil cooler to maintain the compressors temperature between minimum and maximum limits.

A water/oil cooler will be provided to cool the compressor. The cooler will be sized to meet the duty cycle requirements as specified. The oil cooler will use water from the vehicle fire pump as the cooling medium and will be protected from freezing by adequate drains and other means.

A heavy duty, automotive type, dry element air cleaner will be provided. The air cleaner will be mounted in such a manner as to be easily serviced. The air cleaner will be mounted, or the inlet of the filter routed, in such a manner that the air cleaner intakes fresh air from outside the vehicle body.

The system will have the following safety or monitoring devices.
Minimum pressure valve
Compressor lube temperature gauge
Compressor system pressure gauge
Air flow meter
Compressor lube temperature warnings, audible and visible

High pressure relief valve on receiver tank
Applicable warning and information decals

The compressors PTO controls will be installed in such a manner as to render the PTO inoperative if the fire pump is not engaged. Further, the air compressor's PTO engagement will be prevented at compressor pressures above 10 psi at compressor re-start. The air compressor will be controlled by a modulating inlet valve mounted on the air compressors inlet port. A controller will be provided that senses air pressure and controls the delivery volume of the air compressor while maintaining a constant pressure. The controller will feature an automatic balancing system to maintain the air pressure within plus or minus 5% of the discharge pressure of the fire pump, throughout a pressure range of 60psi to 175psi.

The compressor system will have operators controls at the pump panel for the following functions.

Automatic pressure regulation, to match the compressor discharge pressure to the pump discharge pressure.
Fixed pressure regulation, to set the air pressure at on pressure for the use of air tools, etc.
PTO engagement switch
PTO engaged indicator light

18. CAF Air Delivery System Materials: The CAF system air delivery materials will be stainless steel, bronze, or brass. No cadmium plated or raw steel fitting will be used. The CAF air valve manifold block may be aluminum material. All other fittings from the compressor MPV to the respective discharges will be stainless steel, bronze, or brass.