

# FREDERICK-FIRESTONE FIRE PROTECTION DISTRICT



TYPE 6 ENGINE APPARATUS  
GREG GILBERT – BATTALION CHIEF  
JEREMY A. YOUNG – FIRE CHIEF



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**For Custom Type 6 Engine Apparatus for Frederick-Firestone Fire Protection District  
a Colorado Special District**

The Frederick-Firestone Fire Protection District (District) is soliciting written proposals and quotes for a Custom Type 6 Engine to be provided for the District. This is a Guaranteed Maximum Price (GMP) public works project. The District is conducting a Qualifications Based Selection process to retain a manufacturer/vendor for the aforementioned services. The Type 6 Engine will enable the District to significantly improve fire suppression, rescue, and emergency services. The services provided by the selected vendor will include preparation of final bidding and specification documents, preparation, and submittal of a final quote for all services to be provided by the vendor, any necessary consultation meetings, site visits, pre-construction and construction meetings for the apparatus.

Sealed proposals responsive to this Request for Proposals ("RFP") must be submitted by providing the information requested in this RFP by **12:00 pm MDT on Wednesday, October 5, 2022**, to:

**Frederick-Firestone Fire Protection District RFP 2022 - 04  
Attn: Greg Gilbert – Battalion Chief  
8426 Kosmerl Place  
Frederick, Colorado 80504  
970-962-4763 Cell**

During the quote preparation process, all communication, correspondence, questions, or requests for clarification shall be directed to Battalion Chief Greg Gilbert by email ([ggilbert@fffd.us](mailto:ggilbert@fffd.us)). General questions may be communicated by phone; however, specific requests for clarifications must be e-mailed. Failure to comply with this requirement may result in disqualification.

Submitting vendors shall mail or hand-deliver at minimum one (1) hard copy and one (1) digital copy in Microsoft Word or Adobe PDF format of the proposal to the above stated address. Mailed proposals must be received by the District by the above stated submittal deadline.

A proposal may be withdrawn at any time before the deadline for submitting proposals by notifying the District by writing of the intent to withdrawal. The notice must be signed by the representative of the vendor who submitted the quote. The vendor may thereafter submit a new or modified quote, provided that it is received at the District no later than the deadline. Modification offered in any other manner, oral or written, will not be considered. Quotes cannot be changed after the submission deadline unless the District requests clarification.

If a vendor discovers any ambiguity, conflict, discrepancy, omission, or other error in the RFP, the vendor must immediately provide the District with written notice of the problem and request that the RFP be clarified or modified. Without disclosing the source of the request, the District may modify the RFP before the proposal submission deadline by issuing an addendum to all potential bidders to whom the RFP was sent.

If, before the proposal submission deadline, a vendor knows of or should have known of an error in the RFP but fails to notify the District of the error, the vendor shall submit a proposal at its own risk, and if, awarded the project, shall not be entitled to additional compensation or time by reason of the error or its later correction.

All materials submitted in response to this RFP will become the property of the District. All proposals submitted to the District shall constitute public records within the meaning of the Colorado Public (Open) Records Act (CORA) and may be subject to inspection and disclosure to the public in accordance with CORA. A vendor that desires any aspect of its proposal to remain confidential must specifically identify the confidential portion of the proposal and the grounds for claiming confidentiality. Further, the confidential portion must be easily segregated from the rest of the proposal.

This RFP is a solicitation for quotes and proposals and not an offer to contract. The District reserves the right to accept or reject any or all proposals. The District further reserves the right to issue clarifications and other directives concerning this RFP, to require clarification or further information with respect to any proposal, and to determine the final terms of any contract for services. All costs incurred by a vendor for proposal preparation, interviews and contract negotiations are the sole responsibility of the proposing vendor. All prices and services submitted in the quote shall be binding and valid for 90-days after the closing date.

### **SECTION A - BACKGROUND INFORMATION**

The District currently provides fire suppression, community risk reduction, emergency medical care and transport, and administrative services from four (4) fire stations and one (1) administrative building. The District serves a 36-square mile area in the Town of Frederick, the Town of Firestone, and unincorporated areas of Southwest Weld County. The District provides all-hazard response to over 30,000 residents of the Carbon Valley Area.

The Frederick-Firestone Fire Protection District is accepting bids for a Custom Type 6 Engine on a four (4) wheeled drive chassis. The cab shall have seating for five (5). The main fire pump shall be a minimum of 50 gpm with a poly water tank with a minimum of 300 gallons. The motor will be a minimum of 500 horsepower.

Bids will be evaluated based on the requirements established by the Frederick-Firestone Fire Protection District, which may include criteria to determine acceptability, such as inspection, testing, quality, workmanship, delivery, and suitability for a particular purpose. The Frederick-Firestone Fire Protection District has the right to reject any and all bids or to waive any irregularity in any bid. Acceptance of any bid is conditioned upon the parties executing a mutually acceptable Fire Apparatus Purchase Agreement, which will include, among other provisions, a delay damage provision. Bidders are solely responsible for all costs and expenses incurred during the bid process.

**SECTION B – SCHEDULE FOR PROJECT SERVICES**

- September 6 RFP is released
- September 7 – October 7 Vendor questions submitted.
- October 10 Bids are submitted
- October 11– November 11 Bid Compliance Evaluations
- November 15 Successful vendor selected & notified

**SECTION C - PROPOSAL SUBMITTAL REQUIREMENTS**

The proposals shall adhere to the following contents:

Item	Requirement	Comply (Y or N)	Exception (Y or N)
A.	<p><b><u>INTENT OF SPECIFICATIONS</u></b></p> <p>1) It is the intent of these specifications to cover the furnishing and delivery to the Frederick-Firestone Fire Protection District of a complete apparatus equipped as hereinafter specified. With a view to obtaining the best results and the most acceptable apparatus for service in the fire departments, these specifications cover only general requirements as to the type of construction and tests to which the apparatus must conform, together with certain details as to finish, equipment, and appliances with which the successful bidder must conform. Minor details of construction and materials where not otherwise specified are left to the discretion of the contractor, who shall be solely responsible for the design and construction of all features. The apparatus shall conform to the requirements of the current (at the time of bid) National Fire Protection Association <b>Pamphlet 1901 for Motorized Fire Apparatus Pumper</b> unless otherwise specified in these specifications.</p> <p>2) Each bid shall be accompanied by a set of “Contractor’s Proposal” consisting of a detailed description of the apparatus and equipment proposed and to which the apparatus furnished under contract must conform.</p> <p>3) <b>In order to make comparison of the specification to the “Contractor’s Proposal “more efficient, the proposal must be in the same order as the specifications. (NO EXCEPTIONS)</b></p>		
B.	<p><b><u>GENERAL CONSTRUCTION</u></b></p> <p>1) The apparatus shall be designed, and the equipment mounted with due consideration to distribution of load between the front and rear axles so that all specified equipment, including filled water tank, a full complement of personnel and fire hose will be carried without injury to the apparatus. Weight balance and distribution shall be in accordance with the recommendations of the International Association of Fire Chief’s (IAFC) and National Fire Association (or American Insurance Association).</p>		

	<p>2) The materials and components called for in the construction and finish of the apparatus described herein such as the body, plumbing, sub-frame, electrical, cab/chassis etc. will be strictly adhered to. After thorough research, the Frederick-Firestone Fire Protection District has determined that these materials are best suited for our application. All manufacturers have access to these raw materials and it would therefore be the manufacturer’s choice not to offer these materials and components.</p> <p>3) <b>In addition, the fire department must obtain a vehicle that will provide an extended in-service life. Therefore, all vendors are required to bid their premium, most heavy-duty model should they offer more than one series or construction grade of apparatus. (NO EXCEPTIONS)</b></p>		
C.	<p><b><u>EXCEPTIONS TO SPECIFICATIONS</u></b></p> <p>1) The following chassis, pump, and body specifications shall be strictly adhered to. Exceptions will be allowed if they are equal to or superior to that specified and provided, they are <u>listed and fully explained</u>. A full description shall be provided on a separate piece of paper and include the page number and paragraph title of which you are taking exception. <u>The opinion of which is equal to or superior will be the decision of the fire district.</u> If "no" exception is taken to a paragraph, then it will be strictly adhered too.</p>		
D.	<p><b><u>DELIVERY REQUIREMENTS</u></b></p> <p>1) The apparatus shall be completely equipped as per these specifications upon arrival and on completion of the required tests shall be ready for immediate service in the fire department of the purchaser. Any and all alterations required at the scene of delivery to comply with these specifications must be done at contractor's expense. To ensure proper break-in of all components while still under warranty, apparatus is to be delivered under its own power, rail or truck freight is not accepted.</p> <p>2) A qualified delivery engineer representing the contractor shall deliver the apparatus and remain in the Fire Department a sufficient length of time to instruct the Department personnel in the proper use, operation, care and maintenance of the equipment involved.</p> <p>3) The following items, in quantity shown, will be included in the bid price submitted for the fire apparatus and will be furnished to the fire department upon delivery in digital format:</p> <ul style="list-style-type: none"> <li>a. Operator's Manual (2)</li> <li>b. Equipment Maintenance Manual (2)</li> <li>c. Letter of certification for the third-party pump</li> </ul>		

	<p>test (2)</p> <p>d. Complete "As Wired" electrical diagram for apparatus (2)</p>		
E.	<p><b><u>NOTE</u></b></p> <p>1) It is understood that in many aspects these specifications are detailed in their design to set forth minimum quality features for each prospective bidder. It is understood that exceptions will be taken by some bidders.</p> <p>2) To fully evaluate each bid, each bidder shall submit a drawing of the exact apparatus being proposed with the bid. Left, Right, Top and Rear views shall be shown with all apparatus body details and compartment dimensions. <b>Bids submitted with drawings of similar units or with no proposal drawings shall be considered unresponsive and will be cause for the rejection of the bid.</b></p> <p>3) Drawings will include basic dimensions of the apparatus to include at a minimum:</p> <ol style="list-style-type: none"> <li>a. Overall length</li> <li>b. Cab length</li> <li>c. Box length</li> <li>d. Cab height</li> <li>e. Body height</li> <li>f. Highest point on the apparatus</li> <li>g. Turn radius</li> <li>h. Ground to cab floor height</li> </ol>		
F.	<p><b><u>QUALITY AND WORKMANSHIP</u></b></p> <p>1) The design of the apparatus must embody the latest approved automotive engineering practices. The workmanship must be of the highest quality in its respective field. Special consideration will be given to the following points: Accessibility of the various units which require periodic maintenance operations; ease of operations (including both pumping and driving); and symmetrical proportions. Construction must be rugged and ample safety factors must be provided to carry loads as specified and to meet both on and off road "Performance Tests and Requirements".</p>		
G.	<p><b><u>WARRANTIES AND GUARANTEES</u></b></p> <p>1) The bidder will warrant the apparatus to be free from mechanical defects in workmanship for a period of one (1) year. The entire year will be covered for parts and labor costs associated with repairs. When possible, warranty work will be done where the apparatus is housed. The following minimum warranties shall apply, if your warranty is different, please fill in the blank. If the blanks are not filled in, we will assume you meet the warranty criteria.</p>		

	<ul style="list-style-type: none"> <li>a. Chassis Bumper to Bumper: 3 Year _____</li> <li>b. Bumper to Bumper: 1 Year _____</li> <li>c. Engine: 5 years, 100,000 miles _____</li> <li>d. Transmission: 5 years _____</li> <li>e. Axles: 2 Years _____</li> <li>f. Chassis Frame: Lifetime _____</li> <li>g. Pump: 5 years _____</li> <li>h. Water Tank: Lifetime (Non-Prorated) _____</li> <li>i. Apparatus Body: Structural 10 years _____</li> <li>j. Apparatus Cab: Structural 10 years _____</li> <li>k. Apparatus Body: Corrosion Perforation 10 yrs. _____</li> <li>l. Paint: 10 years or 100,000 miles _____</li> </ul>		
<p>H.</p>	<p><b><u>USA MANUFACTURER</u></b></p> <p>1) The entire apparatus shall be assembled within the borders of the Continental United states to insure more readily available parts (without added costs and delays caused by tariffs and customs) and service, as well as protection the purchaser should legal action ever be required. Fire apparatus components and assembly shall be U.S. Made. The Frederick-Firestone Fire Protection District reserves the right to accept the lowest and / or best performance bids to meet the mission of the fire district. Frederick-Firestone Fire Protection District also reserves the right to waive any informality.</p>		
<p>I.</p>	<p><b><u>INSPECTION TRIPS</u></b></p> <p>1) PRE-CONSTRUCTION MEETING</p> <ul style="list-style-type: none"> <li>a. There will be a Chassis Pre-Construction meeting at the manufacture with a chassis representative and an OEM representative. Three (3) representatives from Frederick-Firestone Fire District provided which includes: air travel, ground transportation, food, and lodging (If plant is located more than 200 miles away).</li> </ul> <p>2) CHASSIS PRE-CONSTRUCTION MEETING</p> <ul style="list-style-type: none"> <li>a. There will be a chassis final inspection at the chassis manufacturer facility with three (3) representatives from Frederick-Firestone Fire District and an OEM representative. Three (3) representatives from Frederick-Firestone Fire District provided which includes: air travel, ground transportation, food, and lodging. (If plant is located more than 200 miles away)</li> </ul> <p>3) FINAL PRE-DELIVERY INSPECTION</p> <ul style="list-style-type: none"> <li>a. There will be a pre-delivery factory inspection trip for three (3) representatives from Frederick-Firestone Fire District provided which includes: air travel, ground transportation, food, and lodging. (If plant is located more than 200 miles away)</li> </ul>		

J.	<p><b><u>PATENTS</u></b></p> <p>1) The apparatus manufacturer will pay all royalties and license fees and will hold and save the fire department, its officers, agents, servants, and employees harmless from liability of any nature and kind, including costs, and expenses for or on account of any patented or non-patented invention, process, article, or appliance manufactured or used on the performance of the contract including its use by the fire department. In this respect, the successful bidder will defend all suits or claims for infringement of any patent or license right.</p>		
K.	<p><b><u>ASSIGNMENTS</u></b></p> <p>1) The manufacturer will not assign, transfer, convey, or otherwise dispose of the contract or his right to execute it or his right, title, or interest to it or any part thereof, or assign any of the money's due or become due under the contract, without the prior written consent of the fire district.</p>		
L.	<p><b><u>NO CONTACT POLICY</u></b></p> <p>1) After the date and time established for receipt of proposal, any contact initiated by any proposer with any Frederick-Firestone Fire Protection District representative other than Battalion Chief Greg Gilbert, concerning this Request for Proposal is prohibited to eliminate all communication errors and conflicts of interest during the proposal process. Any such unauthorized contact may cause the disqualification of the bidder from this procurement transaction.</p> <p><b>Greg Gilbert – Battalion Chief</b>  <b>ggilbert@fffd.us 970-962-4763 Cell</b></p>		
M.	<p><b><u>MODEL</u></b></p> <p>1) The chassis shall be a manufacturer’s designated model to meet the specifications within these specifications. The cab and chassis shall include design considerations for multiple emergency vehicle applications, rapid transit, and maneuverability. The chassis shall be manufactured for heavy duty service with the strength and capacity to support a fully laden apparatus, one hundred (100) percent of the time.</p>		
N.	<p><b><u>MODEL YEAR</u></b></p> <p>1) The chassis shall have a vehicle identification number that reflects a 2023 or 2024 model year.</p>		
O.	<p><b><u>COUNTRY OF SERVICE</u></b></p> <p>1) The chassis shall be put in service in the country of United States of America (USA).  The chassis will meet applicable U.S.A. federal motor</p>		



	<p>vehicle safety standards per CFR Title 49 Chapter V Part 571 as clarified in the incomplete vehicle book per CFR Title 49 Chapter V Part 568 Section 4 which accompanies each chassis.</p>		
<p>P.</p>	<p><b><u>COMPLIANCE WITH LAWS</u></b></p> <ol style="list-style-type: none"> <li>1) Proposals must comply with all Federal, State, County and local laws governing or covering this type of service and fulfillment of all ADA (Americans with Disabilities Act) requirements. All materials submitted in response to this bid will become the property of the Fire District.</li> <li>2) All proposals submitted to the Fire District shall constitute public records within the meaning of the Colorado Public (Open) Records Act and may be subject to inspection and disclosure to the public in accordance with Act. A bidder that desires any aspect of its proposal to remain confidential must specifically identify the confidential portion of the proposal and the grounds for claiming confidentiality. Further, the confidential portion must be easily segregated from the rest of the proposal.</li> <li>3) This bid request is not an offer to contract. The Fire District reserves the right to accept or reject any or all proposals. The Fire District further reserves the right to issue clarifications and other directives concerning this bid; to require clarification or further information with respect to any proposal, and to determine the final terms of any contract for services. All costs incurred by a bidder for proposal preparation, interviews and contract negotiations are the sole responsibility of the proposing bidder. All prices submitted in the quote shall be binding and valid for 60 days after the closing date.</li> <li>4) At any time before the Apparatus Purchase Agreement is signed by the successful bidder and the Fire District, the Fire District may in its sole discretion terminate or postpone the bid process or the project and may withdraw any conditional award.</li> </ol>		

**SECTION D – BID PACKET**

The following parameters and guidelines will be followed during the preparation of the bid

packet:

Item	Requirement	Comply (Y or N)	Exception (Y or N)
A.	<p><b><u>TIMELY PROPOSALS</u></b></p> <p>1) Bids must be returned to the Frederick-Firestone Fire Protection District Administrative Offices no later than 12:00pm on Wednesday, October 5, 2022. There will be no formal bid opening.</p> <ul style="list-style-type: none"> <li>a. The Bid Proposals as requested</li> <li>b. Preliminary drawing(s)</li> <li>c. Exceptions to Specifications</li> <li>d. Optional Bid items and associated cost</li> <li>e. Contractor’s Specifications</li> <li>f. Total Pricing</li> </ul> <p>2) It is the bidder’s responsibility to see their proposals arrive on time. Late proposals, facsimiles, e-mails, or telephone bids shall not be considered.</p>		
B.	<p><b><u>BODY COMPARTMENT SPACE</u></b></p> <p>1) The bidder shall give total square feet of the usable compartment space in the body of the apparatus.</p>		
C.	<p><b><u>BUILD TIME</u></b></p> <p>1) The bidder shall give an estimate timeline to build and deliver the apparatus with drop-dead date provided.</p>		
D.	<p><b><u>EXCEPTION TO SPECIFICATIONS</u></b></p> <p>1) Exceptions shall be allowed if they are equal to or superior to that specified (as judged by the customer), and provided they are listed and fully explained on a separate page entitled “EXCEPTIONS TO SPECIFICATIONS”. Exception lists shall refer to the specification page number.</p>		
E.	<p><b><u>CONTRACTOR’S SPECIFICATIONS</u></b></p> <p>1) Each bid shall be accompanied by a set of “Contractor’s Specifications” consisting of a detailed description of the apparatus and equipment proposed and to which the apparatus furnished under contract must conform. These specifications shall indicate size, type, model and make of all component parts and equipment.</p>		
F.	<p><b><u>PRICING AND FINANCING</u></b></p> <p>1) All pricing and financing related to the bid included base price, exceptions, options and financing available shall be placed in a separate sealed package.</p>		
G.	<p><b><u>SERVICE</u></b></p> <p>1) The builder must have an acceptable service center with 50 miles drive time from the Fire District</p>		

	boundaries. If the bidder does not have an acceptable service center within 50 miles and will approve and reimburse the Fire District's maintenance partner to do all warranty/repair work, this will be accepted.		
I.	<b><u>CROSSMEMBERS WARRANTY</u></b> 1) A lifetime parts and labor warranty shall be provided on all chassis frame cross-members.		
J.	<b><u>WARRANTY 3-YEAR CUSTOM CHASSIS</u></b> 1) The custom chassis shall be warranted to be free from defects in materials or workmanship under normal use and service. The builder 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 <b>three (3) years</b> . 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 cross-members are to be covered under separate warranties throughout these specifications.		
K.	<b><u>BODY STRUCTURAL INTEGRITY WARRANTY</u></b> 1) 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.		
L.	<b><u>CAB PAINT WARRANTY</u></b> 1) 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.		
M.	<b><u>PAINT LIMITED WARRANTY</u></b> 1) The apparatus body and pump house shall be free of blistering, peeling and any other adhesion defect caused by defective manufacturing methods or paint material selection for exterior surfaces for a period of five (5) years starting thirty (30) days after the original invoice date.		
N.	<b><u>CORROSION LIMITED WARRANTY</u></b> 1) The body exterior paint shall be warranted against corrosion perforation for period of ten (10) years starting thirty (30) days after the original invoice date.		

O.	<b><u>STANDARD ONE (1) YEAR WARRANTY</u></b> 1) 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.		
P.	<b><u>CAB STRUCTURAL WARRANTY</u></b> 1) 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.		
Q.	<b><u>ENGINE WARRANTY</u></b> 1) The engine shall be warranted for a period of five (5) years or 100,000 miles, whichever occurs first.		
R.	<b><u>TRANSMISSION WARRANTY</u></b> 1) The series transmission shall be warranted for a period of five (5) years with unlimited mileage. Parts and labor shall be included in the warranty.		
S.	<b><u>FRONT SUSPENSION WARRANTY</u></b> 1) The front axle shall be warranted two (2) years with unlimited miles under the general service application.		
T.	<b><u>REAR AXLE WARRANTY</u></b> 1) The rear axles shall be warranted for two (2) years with unlimited miles under the general service application.		
U.	<b><u>PUMP WARRANTY</u></b> 1) The fire pump shall be warranted for a period of five (5) years from the date of delivery.		
V.	<b><u>TANK WARRANTY</u></b> 1) The water tank shall have a lifetime warranty.		
W.	<b><u>INDEPENDENT THIRD-PARTY PUMP CERTIFICATION</u></b> 1) The fire pump shall be tested and certified by the Underwriter's Labs, a nationally recognized independent third-party testing company. Tests shall be conducted so that the pump performs as listed: a. 100% of rated capacity at 150 pounds net pressure b. 70% of rated capacity at 200 pounds net pressure c. 50% of rated capacity at 250 pounds net pressure d. 100% of rated capacity at 165 pounds net pressure  2) The entire pump, both suction and discharge passages, shall be hydrostatically tested to a pressure of 600psi. The pump shall be fully tested at the pump manufacturer's factory to the performance spots as		

	outlined by the latest <b>NFPA pamphlet number 1901</b> . The pump shall be free from objectionable pulsation and vibration.		
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**SECTION E – CONTRACT DETAILS**

<b>Item</b>	<b>Requirement</b>	<b>Comply (Y or N)</b>	<b>Exception (Y or N)</b>
A.	<p><b><u>AWARD OF CONTRACT</u></b></p> <p>1) All bids submitted shall be good for a minimum of ninety (90) days from bid proposal deadline. After the evaluation and award process is complete, all bidders shall be notified of the results.</p>		
B.	<p><b><u>AMENDMENT/ORAL STATEMENTS</u></b></p> <p>1) No oral statement of any person shall modify or otherwise change, or affect the terms, conditions or specifications stated in the resulting contract. All amendments to the contract will be made in writing by the Fire District purchasing agent.</p>		
C.	<p><b><u>DEFAULT</u></b></p> <p>1) The Fire District reserves the right to terminate the contract immediately in the event the bidder/builder fails to meet delivery or completion schedules, or otherwise perform in accordance with the accepted proposal. Breach of contract or default authorizes the Fire District to purchase like services elsewhere and charge the full increase in cost to the defaulting bidder/builder.</p>		
D.	<p><b><u>PERFORMANCE BOND</u></b></p> <p>1) The successful bidder shall, within 15 days of executing the contract, supply the Frederick-Firestone Fire Protection District with a 100 percent performance bond. The performance bond shall be furnished by the manufacturer of the proposed apparatus. The performance bond (surety bond) shall cover standard one (1) year warranty period only and shall not cover extended warranties offered by the seller or other component manufacturer.</p>		
E.	<p><b><u>COMMERCIAL GENERAL LIABILITY INSURANCE</u></b></p> <p>1) The successful bidder shall, during the performance of the contract and for three (3) years following acceptance of the product, keep in force at least the following minimum limits of commercial general liability insurance:</p>		

	<ul style="list-style-type: none"> <li>a. Products/completed operations aggregate \$1,000,000</li> <li>b. Personal and advertising injury \$1,000,000</li> <li>c. Each occurrence \$1,000,000</li> </ul> <p>2) Coverage shall be written on a commercial general liability form. The policy shall be written on an occurrence form and shall include contractual liability coverage for bodily injury and property damage subject to the terms and conditions of the policy. The policy shall include owner as an additional insured, when required by written contract.</p>		
F.	<p><b><u>COMMERCIAL AUTOMOBILE INSURANCE</u></b></p> <p>1) The successful bidder shall, during the performance of the contract keep in force at least the following minimum limits of commercial automobile insurance:</p> <p style="padding-left: 40px;">Combined Single Limit \$1,000,000</p> <p>2) Coverage shall be written on a Commercial Automobile Form.</p>		
G.	<p><b><u>UMBRELLA/EXCESS LIABILITY INSURANCE</u></b></p> <p>1) The successful bidder shall, during the performance of the contract and for three (3) years following acceptance of the product, keep in force at least the following minimum limits of umbrella liability insurance:</p> <ul style="list-style-type: none"> <li>1. Aggregate                               \$10,000,000</li> <li>2. Each Occurrence                       \$10,000,000</li> </ul> <p>2) The umbrella policy shall be written on an occurrence basis and at a minimum provide excess to the bidder's general liability, automobile liability and the employer's liability policies. The business owner shall be included as an additional insured on the general liability policy as their interest may appear. The required limits can be provided by one or more policies, provided all other insurance requirements are met. Coverage shall be provided by a carrier rated A- or better by A.M. Bests. The bidder agrees to furnish the owner with a current certificate of insurance with the coverage's listed above along with its bid. The certificate shall show the purchaser as certificate holder. The certificate of insurance shall provide the following cancellation clause: should any of the</p>		

	<p>above-described policies be cancelled before the expiration date thereof, the issuing insurer will endeavor to mail thirty (30) days written notice to the certificate holder named to the left. Failure to do so shall impose no obligation or liability of any kind upon the insurer, its agents, or representatives.</p>		
H.	<p><b><u>OPERATION AND SERVICE DOCUMENTATION</u></b></p> <p>1) The contractor shall supply, at time of delivery, at least two sets of complete operation and service documentation covering the completed apparatus as delivered and accepted. The documentation shall address at least the inspection, service, and operations of the fire apparatus and all major components thereof. The contractor shall deliver with the apparatus all manufacturer’s operations and service documents supplied with components and equipment that are installed or supplied by the contractor.</p>		
I.	<p><b><u>NFPA REQUIRED MANUALS</u></b></p> <p>1) The construction, operation, and service documentation shall be provided electronically as outlined above. These manuals shall be written in a “step by step” format for ease of reference. There shall be two (2) copies provided with the apparatus as standard. The NFPA required manuals will be in an electronic (PDF) format.</p>		
J.	<p><b><u>DELIVERY</u></b></p> <p>1) To ensure proper break-in of all components while still under warranty, the apparatus shall be delivered under its own power (rail or truck freight shall not be acceptable). The customer shall pick up the completed apparatus from the apparatus manufacturer facility.</p>		
K.	<p><b><u>PERFORMANCE TESTS AND REQUIREMENTS</u></b></p> <p>1) A road test shall be conducted with the apparatus fully loaded and a continuous run of ten (10) miles or more shall be made under all typical driving conditions, during which time the apparatus shall show no loss of power or overheating.</p>		
L.	<p><b><u>TITLE</u></b></p> <p>1) The awarded supplier shall provide Title work for the new vehicle within ten (10) days after the receipt of payment and delivery from the Frederick-Firestone Fire Protection District.</p>		
M.	<p><b><u>CONSTRUCTION DOCUMENTATION</u></b></p> <p>1) The builder shall supply, at the time of delivery, at least one copy of the following documents:</p> <ol style="list-style-type: none"> <li>a. The manufacturer’s record of apparatus construction details, include the following</li> </ol>		

	<p>information:</p> <ul style="list-style-type: none"> <li>i. Owner’s name and address</li> <li>ii. Apparatus manufacturer, model, and serial number</li> <li>iii. Chassis make, model and serial number</li> <li>iv. GVWR of front and rear axles</li> <li>v. Front tire size and total rated capacity in pounds.</li> <li>vi. Rear tire sizes and total rated capacity in pounds.</li> <li>vii. Chassis weight distribution in pounds with water and manufacturer mounted equipment (front and rear).</li> <li>viii. Engine make, model, serial number, rated horsepower and related speed, and governed speed.</li> <li>ix. Type of fuel and fuel tank capacity.</li> <li>x. Electrical system voltage and alternator output in amps.</li> <li>xi. Battery make, model and capacity in cold cranking amps (CCA).</li> <li>xii. Chassis transmission make, model, and serial number; and if so equipped, chassis transmission PTO(s) make, model, and gear ratio.</li> <li>xiii. Pump make, model, and rated capacity in gallons per minute and serial number.</li> <li>xiv. Pump transmission make, model, serial number, and gear ratio.</li> <li>xv. Water tank certified capacity in gallons.</li> <li>xvi. Paint manufacturer and paint number(s).</li> <li>xvii. Company name and signature of responsible company representative.</li> </ul> <ul style="list-style-type: none"> <li>b. Certification of slip resistance of all stepping, standing, and walking surfaces.</li> <li>c. Pump manufacturer’s certification of suction capability, apparatus manufacturer’s approval for stationary pumping applications, engine manufacturer’s certified brake horsepower curve showing the maximum governed speed, pump manufacturer’s certification of the hydrostatic test, and the certification of inspection and test for the fire pump.</li> <li>d. Weight documents from a certified scale showing actual loading on the front suspension, rear axle(s), and overall fire apparatus (with the water tank full but without personnel, equipment, and hose).</li> <li>e. Written load analysis and results of the electrical system performance tests.</li> <li>f. Certification of water tank capacity.</li> </ul>		
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N.	<p><b><u>OPERATION and SERVICE DOCUMENTATION</u></b></p> <p>1) One (1) Apparatus Operations and Maintenance manual and one (1) 2GB USB thumb drives shall be supplied with the completed apparatus. The documentation shall address at least the inspection, service, and operation of the fire apparatus and all major components thereof. The builder shall also provide documentation of the following items for the entire apparatus and each major operating system or major component of the apparatus:</p> <ol style="list-style-type: none"> <li>a. Manufacturer’s name and address</li> <li>b. Country of manufacture</li> <li>c. Source of service and technical information</li> <li>d. Parts and replacement information</li> <li>e. Descriptions, specifications, and ratings of the chassis and pump.</li> <li>f. Wiring diagrams for low voltage and line voltage systems to include the following information: representations of circuit logic for all electrical components and wiring, circuit identification, connector pin identification, zone location of electrical components, safety interlocks, alternator-battery power distribution circuits, and input/output assignment sheets or equivalent circuit logic implemented in multiplexing systems.</li> <li>g. Lubrication Charts</li> <li>h. Operating instructions for the chassis, any major components such as a pump or any auxiliary systems.</li> <li>i. Instructions regarding the frequency and procedure for recommended maintenance</li> <li>j. Overall apparatus operating instructions.</li> <li>k. Safety considerations</li> <li>l. Inspection procedures</li> <li>m. Recommended service procedures</li> <li>n. Troubleshooting guide</li> <li>o. Apparatus body, chassis, and other components manufacturer’s warranties.</li> <li>p. Special data required by this standard</li> <li>q. Copies of required manufacturer test data or reports, manufacturer certifications, and independent third-party certifications of test results.</li> <li>r. A material safety data sheet (MSDS) for any fluid that is specified for use on the apparatus.</li> <li>s. The builder shall deliver with the apparatus, all manufacturer’s operations and service documents supplied with components and equipment that are installed or supplied by the builder.</li> </ol>		
O.	<b><u>FAILURE TO MEET TEST</u></b>		

	<p>1) In the event the apparatus fails to meet the test requirements of these specifications on the first trials, second trials may be made at the option of the bidder within 30 days of the date of the first trials. Such trials shall be final and conclusive, and failure to comply with these requirements shall be cause for rejection. Failure to comply with changes to conform to any clause of the specifications, within 30 days after notice is given to the bidder of such changes, shall also be cause for rejection of the apparatus. Permission to keep or store the apparatus in any building owned or occupied by the purchaser, or its use by the purchaser during the above-specified period with the permission of the bidder, shall not constitute acceptance.</p>		
P.	<p><b><u>CONTINGENCY FUND</u></b></p> <p>1) A contingency fund of \$10,000.00 shall be included in the bid packet as part of the bid price. Use of contingency funds require prior approval of the Fire District.</p>		
Q.	<p><b><u>DELIVERY DATE / PENALTY</u></b></p> <p>1) The delivery date shall be given when the contract is signed. The purchase price shall be reduced by \$100 for each day after the delivery date that the Fire Apparatus is not delivered to the Customer.</p>		
R.	<p><b><u>TRAINING</u></b></p> <p>1) The builder shall supply a minimum of three (3) three (3) hour trainings for the Frederick-Firestone Fire Protection District on the operation of the apparatus and the equipment provided on the apparatus at the time of delivery at the factory if needed.</p>		
S.	<p><b><u>ADDITIONAL EQUIPMENT</u></b></p> <p>1) The following additional equipment will be provided with the completed apparatus:</p> <ol style="list-style-type: none"> <li>a. Two (2) wheel chocks <ol style="list-style-type: none"> <li>i. One (1) on each side</li> <li>ii. Yellow in color</li> <li>iii. Mounted horizontally in a quick-release mounting bracket on the outboard corners on the top of the side packs</li> </ol> </li> <li>b. Road Kit containing the following items</li> <li>c. One (1) 5lb DOT approved fire extinguisher with a BC rating shall be shipped loose in the cab with vehicle mounting bracket.</li> <li>d. One (1) set of warning triangle reflectors, containing three folding reflectors in a plastic storage case.</li> <li>e. One (1) 12-ton hydraulic jack with handle</li> <li>f. Pulaski</li> </ol>		

- g. Rogue Rhino FB70
- h. Rogue The beast 55H Ax
- i. Rogue Hoe 60 A
- j. Rogue Hoe 60H#2
- k. Flapper
- l. Backpack Pump X2
- m. Foam, concentrate, Class A (5-gallon)
- n. Chain saw 24" bar
- o. Chainsaw Kit (includes chaps/tools)
- p. Drip Torch X2
- q. Fire Rack
- r. McLeod
- s. Combination Tool
- t. Gorgui Multi Tool
- u. First Aid Kit
- v. Burn Kit
- w. Flashlight, general service
- x. Lug Wrench
- y. Pliers, fence
- z. Rope/Cord
- aa. Bolt Cutters
- bb. Cooler or Ice Chest
- cc. Hose Clamp
- dd. Hose Gaskets (ea)  $\frac{3}{4}$ , 1, 1  $\frac{1}{2}$ , 2  $\frac{1}{2}$  inch
- ee. Pail, collapsible
- ff. Fire Extinguisher (5 lb)
- gg. Can, gas, 5-Gal, DOT/OSHA approved
- hh. General Tool Kit
- ii. File, mill, bastard
- jj. Chaps, protective
- kk. Portable Radio X3
- ll. Mobile Radio
- mm. Suction (length, 8' or 10')
- nn. 1" NPSH 300 feet
- oo. 1  $\frac{1}{2}$ " NH 300 feet
- pp.  $\frac{3}{4}$ " NH, garden 300 feet
- qq. 1  $\frac{1}{2}$ " NH, engine protection 50 foot
- rr. 1  $\frac{1}{2}$ " NH, refill 300 feet
- ss. Forester, 1" NPSH
- tt. Adjustable, 1" NPSH
- uu. Adjustable, 1  $\frac{1}{2}$ " NH
- vv. Adjustable,  $\frac{3}{4}$ " NH
- ww. Foam,  $\frac{3}{4}$ " NH
- xx. Foam 1  $\frac{1}{2}$ " NH
- yy. Mop-up Wand
- zz. Tip, Mop-up Wand
- aaa. Tip, Forester, Nozzle, fog
- bbb. Tip, Forester Nozzle, straight stream
- ccc. Foot, w/strainer
- ddd. 1" NPSH x 1/12" NH, Jet Refill
- eee. Hydrant, adjustable, 8"
- fff. Spanner, 5", 1" to 1  $\frac{1}{2}$ " hose size

	ggg. Spanner, 11", 1 ½" to 2 ½" hose size hhh. Pipe, 14" iii. Pipe, 20" jjj. Belt Weather Kit kkk. Binoculars		
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**SECTION F - CAB**

<b>Item</b>	<b>Requirement</b>	<b>Comply (Y or N)</b>	<b>Exception (Y or N)</b>
A.	<b><u>CAB STYLE</u></b> 1) The cab shall be configured as four (4) full door crew cab.		
B.	<b><u>INTERIOR</u></b> 1) All interior upholstery/hardware including seating, dashboard, floor coverings, steering wheel, dash components, sun visors and all trim and door panels shall be Ford OEM supplied vinyl and color coordinated. <ul style="list-style-type: none"> <li>a. Six (6) upfitter switches located on the overhead console</li> </ul>		
C.	<b><u>EXTERIOR</u></b> 1) The following OEM supplied exterior hardware shall be included: <ul style="list-style-type: none"> <li>a. Front fender vents</li> <li>b. Black or chrome plated grille</li> <li>c. LED headlights</li> <li>d. 3-blink lane change signal</li> <li>e. Roof clearance lights</li> <li>f. Solar tinted glass</li> <li>g. Fixed rear window</li> <li>h. Black or chrome plated door handles</li> <li>i. Under hood service light</li> </ul>		
D.	<b><u>MIRRORS/ CAB DOOR LOCKS AND WINDOWS</u></b> 1) The mirrors shall be the OEM manual telescoping trailer tow mirrors remotely adjustable, heated glass, heated convex spotter mirrors, integrated clearance lights and turn signals.		
E.	<b><u>CAB DOOR LOCKS AND WINDOWS</u></b> 1) Chassis shall be equipped with power windows and door locks.		
F.	<b><u>CAB CONSOLE</u></b> 2) The cab shall be equipped with an angled front, form-fitted control console located between the front driver's and officer's seats. This console shall be sized to accommodate the installation of a switch panel for the control of the emergency and general illumination		

	<p>lighting, siren controller, traffic advisor control head, and customer-mounted radios. The switch panel shall consist of a sixteen (16) switch multiplex module with lighted switches. The switch module shall have back lighted identification plates on a non-glare panel surface. The switch panel shall be illuminated whenever the master switch is in the “ON” position. Panel light brightness shall dim automatically via the multiplexing system when the chassis headlights are turned "ON". The cab console shall be fabricated from steel, and powder coated with a black finish.</p> <p>3) The following controls and switches shall be positioned from forward to rear on the center console as follows:</p> <ul style="list-style-type: none"> <li>a. One (1) LED blue/white flexible map light</li> <li>b. Two (2) faceplate for customer specified radios</li> <li>c. An Innovative Products, Inc. Magnetic Mic base for each of the department's radios</li> <li>d. One (1) microphone hanger for the electronic siren microphone</li> <li>e. One (1) switch panel with sixteen (16) switches</li> <li>f. One (1) electronic siren controller</li> <li>g. Four (4) cup holders</li> <li>h. Two (2) adjustable arm rests</li> <li>i. Two (2) 12-volt aftermarket power outlets</li> <li>j. Four (4) 12-volt USB outlets</li> <li>k. One (1) 6.00-inch storage compartment</li> </ul> <p><i>4) The specific console layout shall be discussed/determined during the pre-work conference and a drawing of the layout shall be provided to the department for approval.</i></p>		
G.	<p><b><u>SEATING</u></b></p> <ul style="list-style-type: none"> <li>1) All seating positions shall have OEM certified seat belts. <ul style="list-style-type: none"> <li>a. Front - OEM supplied 40/20/40 vinyl split bench with center portion removed for console</li> <li>b. Rear - OEM supplied 60/40 vinyl bench seat</li> </ul> </li> </ul>		
H.	<p><b><u>STEERING WHEEL</u></b></p> <ul style="list-style-type: none"> <li>1) The chassis shall have a tilt steering for maximum comfort and ease of operation by multiple drivers.</li> </ul>		
I.	<p><b><u>CRUISE CONTROL</u></b></p> <ul style="list-style-type: none"> <li>1) The chassis shall have cruise control.</li> </ul>		
J.	<p><b><u>AIR CONDITIONING AND HEATING</u></b></p> <ul style="list-style-type: none"> <li>1) The chassis shall be equipped with OEM air conditioning and heating. A stainless-steel ember separator shall be installed at the intake port for the cab air.</li> </ul>		
K.	<p><b><u>STEREO</u></b></p> <ul style="list-style-type: none"> <li>1) The chassis shall have an OEM factory installed electronic AM/FM/CD radio with auxiliary input port.</li> </ul>		

	Radio shall include a minimum of four (4) speakers.		
L.	<b><u>WINDOW TINT</u></b> 1) Tint all windows, all rear 15%, and the front 20%.		

**SECTION G - CHASSIS**

Item	Requirement	Comply (Y or N)	Exception (Y or N)
A.	<b><u>CHASSIS</u></b> 1) The completed apparatus shall be mounted on a new 2023 or 2024 Ford Super Duty F-550 XL series 4x4 chassis, or similar, model with four (4) full doors that open to the rear of the apparatus.		
B.	<b><u>GROSS VEHICLE WEIGHT RATING</u></b> 1) The chassis shall be equipped with a heavy-duty payload package. Included in the package will be an upgraded frame, upgraded rear axle, upgraded rear spring, and increased GVWR to 19,500 lbs.		
C.	<b><u>CAB-TO-AXLE</u></b> 1) The cab-to-axle measurement shall be approximately 60.00-inches.		
D.	<b><u>BATTERY</u></b> 1) The chassis shall be equipped with two (2), 78 Amp, 12-volt maintenance free batteries totaling 750 cold cranking amps.		
E.	<b><u>WHEELBASE</u></b> 1) The wheelbase shall be no greater than approximately 179.00-inches.		
F.	<b><u>REGENERATION CONTROL</u></b> 1) The chassis shall be equipped with the Fire / Rescue Prep package. This package shall include the following features: a. Operator Command Regeneration (98R) b. Dual Heavy-Duty Alternators (67A) c. 7,000 lbs. Front Axle Rating 2) This prep package will allow the end user to place the chassis into "forced" regeneration at a minimum of 30 percent. The prep package will also allow the end user to operate that chassis on an empty diesel exhaust fluid (DEF) tank for an extended period. 3) Summarized directions for regeneration operations shall be on a sticker that is affixed to the visor on the driver's side so that it is visible/readable when the visor is folded down.		

G.	<p><b><u>CHASSIS COMPONENT PROTECTION</u></b></p> <ol style="list-style-type: none"> <li>1) The chassis shall be equipped with impact protection/skid plates in the following locations: <ol style="list-style-type: none"> <li>a. Lower radiator</li> <li>b. Transfer case</li> <li>c. Engine block</li> </ol> </li> <li>2) The design shall allow for regular maintenance and checks of common items (oil drain, oil filter, differential fluids, grease fitting, etc.) without major disassembly. These guards and shields shall be designed to prevent trapping common grasses and other small debris which may ignite. Reasonable component protection shall be provided as manufacturer deems necessary for operations in extreme environments and conditions for easily damaged electrical components, drive line, cooling system, and/or suspension components. Intent of the shielding is to assist in the protection of the undercarriage components from impact during road less operations and to assist in the survivability of the apparatus. Skid plates and impact protection shall be capable of supporting the weight of the apparatus without complete failure, a degree of distortion is allowed. All exterior surfaces of the skid plates/impact protection shall be coated with a minimum 1-2 mm flat black powder coated finish.</li> </ol>		
H.	<p><b><u>FUEL TANK</u></b></p> <ol style="list-style-type: none"> <li>1) The chassis shall be equipped with a single 40-gallon fuel tank.</li> </ol>		
I.	<p><b><u>TRANSMISSION</u></b></p> <ol style="list-style-type: none"> <li>1) The chassis shall be equipped with a heavy duty TorqShift 6-speed SelectShift automatic transmission with Tow/Haul mode.</li> </ol>		
J.	<p><b><u>TRANSFER CASE</u></b></p> <ol style="list-style-type: none"> <li>1) The chassis shall be equipped with a manual transfer case including manual locking front hubs. The transfer base shall be protected by a skid plate.</li> </ol>		
K.	<p><b><u>AXLES</u></b></p> <ol style="list-style-type: none"> <li>1) The front drive axle shall have a minimum ground rating capacity of 7,000 pounds.</li> <li>2) The rear drive axle shall have a minimum ground rating capacity of 14,706 pounds.</li> <li>3) A manually controlled rear differential lock shall be installed if available from the OEM chassis manufacturer.</li> <li>4) The axles shall each have a 4.88 axle gear ratio. Chassis shall be equipped with Low Deflection Package that includes 2inch spacer blocks.</li> </ol>		
L.	<p><b><u>SUSPENSION</u></b></p>		

	<p>1) The front suspension shall be coil springs with heavy duty gas shock absorbers. The front suspension shall have a minimum rating of 7,000 lbs. The rear suspension shall have a minimum 14,706 lbs. rear leaf suspension with shocks.</p>		
M.	<p><b><u>DUAL REAR WHEELS ON CHASSIS</u></b></p> <p>1) The chassis shall be equipped with dual rear wheels. Mud flaps shall be installed on the apparatus body aft of the rear wheels.</p>		
N.	<p><b><u>WHEELS AND TIRES</u></b></p> <p>1) The chassis shall be equipped with factory steel 19.5-inch wheels and 225/70R19.5 Michelin XDE tires. A full size matched spare tire with rim, 6-ton hydraulic jack, and lug wrench shall be supplied with the completed apparatus.</p>		
O.	<p><b><u>TOW PACKAGE</u></b></p> <p>1) The chassis shall be equipped with an OEM trailer tow package that includes an aftermarket trailer wiring kit. An OEM trailer brake controller shall be optioned on the chassis as well.</p>		
P.	<p><b><u>TRAILER HITCH</u></b></p> <p>1) A Class V trailer hitch shall be mounted to chassis frame at the rear of the apparatus. The hitch shall extend to the leading edge of the rear bumper allowing for improved access. The use of a "stinger" or extension shall not be prohibited to meet this requirement.</p> <p>2) A seven pin (blade) RV style trailer plug shall be located on the rear tail skirt centered between the driver side red DOT light and center red DOT light. The trailer plug shall be installed at least 3 inches above the rear bumper skin.</p>		
Q.	<p><b><u>TOW POINT(S)</u></b></p> <p>1) Two (2) front tow eyes rated for 1.5 times the chassis GVWR shall be integrated into the heavy-duty replacement front bumper.</p> <p>2) Two (2) rear tow eyes rate for 1.5 times the GVWR shall be provided and mounted to the chassis frame. The tow points shall extend through the rear panel just above the rear bumper and shall not interfere with the bumper during the normal twisting of the apparatus.</p> <p>3) All tow eyes shall be large enough to attach a threaded clevis but shall not be large enough to pass a tow strap through. All tow eyes shall be powder coated black and be free of rust and/or chips in the powder coating.</p>		



**SECTION H – ELECTRICAL COMPONENTS AND RATINGS**

Item	Requirement	Comply (Y or N)	Exception (Y or N)
A.	<p><b><u>GENERAL WIRING SPECIFICATION</u></b></p> <ol style="list-style-type: none"> <li>1) A single Original Equipment Manufacturer (OEM) battery system shall be installed consisting of matching batteries to operate both the chassis and package electrical system. A single Cole Hersee on/off switch, or similar, shall be supplied by the body builder. This switch labeled "BODY MASTER ON" shall mount separately or as a part of the master console. When in the "OFF" position, all electrical power to the apparatus fire package shall be off. The batteries shall be installed in an accessible location.</li> <li>2) The apparatus electrical system shall remain independent of the OEM system unless there is authorization from the OEM chassis manufacturer.</li> <li>3) The apparatus body, modules of the apparatus body (i.e. pump house) and chassis shall be individually wired as independent modules and connected as a completed unit at the final assembly via waterproof electrical connectors located in the electrical compartment. The intent of this is to be able to remove portions of the completed apparatus for major service and repair without requiring the electrical system to be cut. Seals shall be provided on each individual wire and the assembly. All GXL/SXL wiring for the apparatus body shall be within a temperature resistant harness rated at a minimum of 280 degrees. All wires in each harness shall be color and function coded. Wiring shall be run along structural rails and tied in a neat and orderly manner. Wiring passing through compartments shall be protected from tears, abrasions, and cuts caused by loose items moving in the compartment space. Wiring shall comply with OEM / component manufacturers recommendations and standards.</li> <li>4) The completed body shall be grounded to the chassis with a minimum "0" gauge wire with crimped and soldered lugs. The lug shall be bolted to the chassis after the removal of all paints, rust, etc. Additionally, a minimum 3/4 inches braided ground strap shall be furnished between the body and chassis. The ground strap shall have soldered tabs on each end and attached to the chassis as above except that stainless steel star washers shall be used between the ground strap tab and bolt. After attachment, all ground connection points shall be</li> </ol>		

	sprayed (soaked) with non-hardening battery terminal sealer. A ground strap shall also be installed from the pump engine to the apparatus body.		
B.	<p><b><u>ELECTRICAL COMPONENTS</u></b></p> <p>1) All electrical components such as solenoids, speakers, motors, etc. shall be environmentally rated to a minimum of IP67 and shall be MIL-STD 810 compliant for temperature, humidity, vibration, altitude, shock, sand and dust, immersion, contamination by fluids, humidity, and solar radiation.</p>		
C.	<p><b><u>WIRE GRADE</u></b></p> <p>1) GXL or SXL Grade Rated from 60-260 F.</p>		
D.	<p><b><u>CONNECTIONS TERMINATIONS</u></b></p> <p>1) Connections shall be environmentally sealed to prevent corrosion.</p>		
E.	<p><b><u>LOOM AND TIES</u></b></p> <p>1) All wire loom and wire ties shall be rated to a minimum of 260 F.</p>		
F.	<p><b><u>MULTIPLEXED ELECTRICAL SYSTEM</u></b></p> <p>1) The electrical system shall be equipped with a Class 1 ES-Key multiplex solid state management system, or similar. The system shall be capable of performing load management functions, system monitoring and reporting, system data recording, remote or at the vehicle diagnostics without the use of additional modules and be fully programmable. The system shall be programmed to discontinue functions, by priority, when the apparatus 12-volt electrical system voltage drops below 11.9-volts.</p> <ol style="list-style-type: none"> <li>a. A single enclosed electrical junction compartment for all apparatus modules, connections, relays, circuit breakers, etc., shall be located inside the cab, in a protected location that does not interfere with available floor space. Wire length within the box shall be sufficient to allow a minimum of 2.00-inches of slack to allow for secure connections and ease of service. All wire shall be installed in an organized fashion and located so that they cannot be disturbed when loading personnel or equipment.</li> <li>b. A placard shall be placed on the inside of the junction box/enclosure lid displaying the input/output layout configuration to simplify the end user's identification of the</li> </ol>		

	inputs/outputs.		
G.	<p><b><u>SPS SWITCH PANEL AND PROGRAMMING</u></b></p> <ol style="list-style-type: none"> <li>1) All accessory and emergency lighting shall be controlled by a master electrical control module mounted in a location within the cab that is easily accessible by driver and operator. The module shall consist of a multiplex smart programmable switch (SPS) module of sixteen (16) one-touch switches. The module shall have back lighted identification plates on a non-glare panel face illuminated when the master switch is "ON".</li> <li>2) The function and layout of the sixteen (16) one-touch switches are as follows with the first switch located at the far left of the panel. <ol style="list-style-type: none"> <li>a. Switch 1 Upper: <b>EMR LIGHTS:</b> <ol style="list-style-type: none"> <li>i. Description: Activates all emergency or hazard lights</li> <li>ii. Function: Switch is press on press off</li> <li>iii. Indicator: Indicator light is solid when on</li> <li>iv. Requires Body Master to be "ON"</li> </ol> </li> <li>b. Switch 1 Lower: <b>HORN/SIREN:</b> <ol style="list-style-type: none"> <li>i. Description: Designates whether the chassis horn toggles the siren or sounds the electrical horn</li> <li>ii. Function: Switch is press on press off</li> <li>iii. Indicator: Illuminates solid in siren mode</li> <li>iv. Requires Body Master to be "ON"</li> </ol> </li> <li>c. Switch 2 Upper: <b>UPPER CANCEL:</b> <ol style="list-style-type: none"> <li>i. Description: Deactivates all upper zone emergency or hazard lights</li> <li>ii. Function: Switch is press on press off</li> <li>iii. Indicator: Indicator flashes when activated</li> <li>iv. Requires Body Master to be "ON"</li> </ol> </li> <li>d. Switch 2 Lower: <b>LOWER CANCEL:</b> <ol style="list-style-type: none"> <li>i. Description: Deactivates all lower zone emergency or hazard lights</li> <li>ii. Function: Switch is press on press off</li> <li>iii. Indicator: Indicator flashes when activated</li> <li>iv. Requires Body Master to be "ON"</li> </ol> </li> <li>e. Switch 3 Upper: <b>HOSE REEL:</b> <ol style="list-style-type: none"> <li>i. Description: Activates the hose reel rewind</li> <li>ii. Function: Switch is momentary</li> </ol> </li> </ol> </li> </ol>		

	<ul style="list-style-type: none"> <li>iii. Indicator: Indicator is solid when pressed</li> <li>iv. Requires Body Master to be "ON"</li> <li>f. Switch 3 Lower: <b>HIGH IDLE:</b> <ul style="list-style-type: none"> <li>i. Description: Activates/Deactivates the high idle function of the chassis motor. This function shall only function if the chassis transmission is in "PARK" and the parking brake is set. The function deactivates if any of the following happen; the chassis transmission is shifted out of "PARK", brake pedal is pressed, parking brake is released, or the switch is pressed again.</li> <li>ii. Function: Switch is press on press off</li> <li>iii. Indicator: Indicator light is solid when on</li> <li>iv. Requires Body Master to be "ON"</li> </ul> </li> <li>g. Switch 4 Upper: <b>DS FLOOD:</b> <ul style="list-style-type: none"> <li>i. Description: Activates/Deactivates the left side swivel flood light</li> <li>ii. Function: Switch is press on press off</li> <li>iii. Indicator: Indicator light is solid when on</li> <li>iv. Requires Body Master to be "ON"</li> </ul> </li> <li>h. Switch 4 Lower: <b>PS FLOOD:</b> <ul style="list-style-type: none"> <li>i. Description: Activates/Deactivates the right-side swivel flood light</li> <li>ii. Function: Switch is press on press off</li> <li>iii. Indicator: Indicator light is solid when on</li> <li>iv. Requires Body Master to be "ON"</li> <li>v. Switch 5 Upper: <b>REAR FLOOD:</b></li> <li>vi. Description: Activates/Deactivates the rear panel flood (backup) lights</li> <li>vii. Function: Switch is press on press off</li> <li>viii. Indicator: Indicator light is solid when on</li> <li>ix. Requires Body Master to be "ON"</li> </ul> </li> <li>i. Switch 5 Lower: <b>UNUSED</b> <ul style="list-style-type: none"> <li>i. Description:</li> <li>ii. Function:</li> <li>iii. Indicator:</li> <li>iv. Requires Body Master to be "ON"</li> </ul> </li> <li>j. Switch 6 Upper: <b>RT GND SWP:</b> <ul style="list-style-type: none"> <li>i. Description: Activates /Deactivates the right-side ground sweep / road</li> </ul> </li> </ul>		
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	<p>spray nozzle tip</p> <ul style="list-style-type: none"> <li>ii. Function: Switch is press on press off</li> <li>iii. Indicator: Indicator light is solid when on</li> <li>iv. Requires Body Master to be "ON"</li> <li>v. Switch cover shall be <b>RED</b> in color</li> </ul> <p>k. Switch 6 Lower: <b>LT GND SWP:</b></p> <ul style="list-style-type: none"> <li>i. Description: Activates /Deactivates the left-side ground sweep / road spray nozzle tip –</li> <li>ii. Function: Switch is press on press off</li> <li>iii. Indicator: Indicator light is solid when on</li> <li>iv. Requires Body Master to be "ON"</li> <li>v. Switch cover shall be <b>RED</b> in color</li> </ul> <p>l. Switch 7 Upper: <b>COMPARTMENT LIGHT MASTER:</b></p> <ul style="list-style-type: none"> <li>i. Description: Activates/Deactivates strip lighting in compartments.</li> <li>ii. Function: Switch is press on press off</li> <li>iii. Indicator: Indicator light is solid when on</li> <li>iv. Requires Body Master to be "ON"</li> </ul> <p>m. Switch 7 Lower: <b>PERIMETER LIGHTS:</b></p> <ul style="list-style-type: none"> <li>i. Description: Activates /Deactivates the perimeter/step lights on the apparatus body and rear bumper</li> <li>ii. Function: Switch is press on press off</li> <li>iii. Indicator: Indicator light is solid when on</li> <li>iv. Requires Body Master to be "ON"</li> </ul> <p>n. Switch 8 Upper: <b>ALARM CANCEL:</b></p> <ul style="list-style-type: none"> <li>i. Description: Cancels the audible alarm that sounds to alert the driver that a cab or compartment door is "OPEN" when the parking brake is released, or the vehicle has a low voltage condition. This alarm cancel function is reset when any of the following actions happen the chassis ignition is turned "OFF", the parking brake is set, or the switch is pressed again.</li> <li>ii. Function: Switch is press on press off</li> <li>iii. Indicator: Indicator flashes when activated</li> <li>iv. Requires Body Master to be "ON"</li> </ul>		
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	<ul style="list-style-type: none"> <li>o. Switch 8 Lower: <b>LIGHT TEST:</b> <ul style="list-style-type: none"> <li>i. Description: Illuminates all apparatus lighting to performing light checks. It shall be programmed to turn "OFF" after 90 seconds to prevent battery draining. It shall be programmed to function only when the parking brake is set.</li> <li>ii. Function: Switch is press on press off</li> <li>iii. Indicator: Indicator flashes when activated</li> <li>iv. Requires Body Master to be "ON"</li> </ul> </li> </ul>		
H.	<p><b><u>SUPERNODE II</u></b></p> <ul style="list-style-type: none"> <li>1) The Supernode II, or similar, shall be installed with data recorder functionality. Shall be mounted in a weather/dust protected compartment. The compartment shall be separate from an equipment storage compartment.</li> </ul>		
I.	<p><b><u>REMOTE DIAGNOSTICS CAPABILITIES</u></b></p> <ul style="list-style-type: none"> <li>1) Remote diagnostic shall be accomplished by using a supplied USB 2.0 "A" male to "A" male cable. One (1) end of the cable will connect directly to the Class 1 ES-Key Supernode II and one (1) end will connect to a laptop computer. The remote diagnostic feature(s) will be done through Class 1's ES-Key Live software.</li> </ul>		
J.	<p><b><u>INDICATION/WARNING LIGHTS</u></b></p> <ul style="list-style-type: none"> <li>1) The following indicator lights are described in greater detail elsewhere in this specification: <ul style="list-style-type: none"> <li>a. Battery On <ul style="list-style-type: none"> <li>i. There shall be a green LED indicator light visible to the driver which illuminates when the master body switch is activated. The light shall be labeled "BODY MASTER". The LED light shall be mounted adjacent to the master switch, in a position that will help reduce glare within the cab during night operations; this light may be programmed to dim when the headlights are on.</li> </ul> </li> <li>b. Door Ajar "DO NOT MOVE APPARATUS" <ul style="list-style-type: none"> <li>i. Red LED indicator light shall be provided in the cab and shall flash automatically when the ignition switch is "ON", and a lighted compartment door is "OPEN", or a</li> </ul> </li> </ul> </li> </ul>		

	<p>chassis cab door is "OPEN".</p> <ul style="list-style-type: none"> <li>c. Low Voltage Alarm <ul style="list-style-type: none"> <li>i. Red LED indicator light shall be provided in the cab. The light shall flash when the apparatus 12-volt electrical system voltage drops below 11.90-volts. The LED light shall be mounted in a position that will help reduce glare within the cab during night operations.</li> </ul> </li> </ul>		
K.	<p><b><u>PERIMETER LIGHTING</u></b></p> <ul style="list-style-type: none"> <li>1) Four (4) 4.00-inch clear LED lights shall be provided around the vehicle’s perimeter. The lights shall be activated when either the “PERIMETER LIGHTS” switch is activated on the center console, when a cab door is "OPEN", or when the vehicle is placed in “blocking mode.” The vehicle is in blocking mode when the vehicle transmission is in “PARK” with the parking brake set and the emergency master switch turned "ON" with the forward facing takedown lights "OFF". The perimeter lighting “OFF” delay shall be synchronized with the chassis exterior courtesy lighting delay. <ul style="list-style-type: none"> <li>a. Perimeter light locations shall be as follows: <ul style="list-style-type: none"> <li>i. Two (2) lights shall be provided facing forward on bulkhead of body, one (1) on each side.</li> <li>ii. Two (2) lights shall be provided under the tail board, protected from impact and debris.</li> </ul> </li> <li>b. The lights shall be wired to the “PERIMETER LIGHTS” switch located in the cab center console</li> </ul> </li> </ul>		
L.	<p><b><u>SCENE LIGHTING</u></b></p> <ul style="list-style-type: none"> <li>1) Scene lighting will be from FireTech. To be switched by upfitter switches. <ul style="list-style-type: none"> <li>a. on driver side-mounted to coffin box at the top and middle of the box.</li> <li>b. on passenger side-mounted to coffin box at top and middle of the box.</li> <li>c. on rear-mounted to coffin box top inside side corner.</li> </ul> </li> <li>2) Surface-mounted side scene lights: <ul style="list-style-type: none"> <li>a. FT-GSMJR – Guardian Jr. x4 with bezel</li> <li>b. WATTAGE: 35</li> <li>c. AMPERAGE @ 12V DC: 2.9A</li> <li>d. VOLTAGE RANGE: 9-32V DC</li> <li>e. RAW LUMENS: 5,000</li> <li>f. EFFECTIVE LUMENS 3,126</li> </ul> </li> </ul>		

	g. DIMENSIONS (WITH BEZEL): 7.41IN X 4.97IN X 1.55IN		
M.	<p><b><u>BACKUP ALARM</u></b></p> <p>1) One (1) Federal Signal solid state back up alarm shall be provided at the rear of the apparatus, protected from impact and debris. The back-up alarm shall be wired to the reverse circuit of the transmission and shall provide an audible alarm to the rear of the apparatus when reverse gear is selected. The alarm shall have a volume of 87 to 112 dB while in operation.</p>		
2)	<p><b><u>MAP LIGHT</u></b></p> <p>1) A LED flexible map light with switch shall be installed on the officer's side, passenger side, of the cab center console. The map light shall be selectable between blue and white light.</p>		
2)	<p><b><u>ANTENNA LEADS AND BASES</u></b></p> <p>1) Two (2) antenna mounts with coaxial cable shall be supplied and installed a minimum of 18.00-inches apart and centered on the chassis cab roof. The components shall consist of a brass 3/4-inch New Motorola (NMO) style Antenna Mount and Double Shielded Coaxial Cable soldered to the base. The coaxial cable shall terminate in the cab console and have a minimum of 4-feet of additional cable. The cable shall be routed from the chassis/cab headliner to the console in a concealed manner. All cables shall be labeled as to where they are installed on the roof. A protective rain cap shall be installed on each NMO antenna mount. Each cap shall be labeled as to the respective pre-wired set by placing a "#1" or "#2" on the rain cap itself.</p>		
2)	<p><b><u>WIRING FOR RADIO(S) INSTALLATION</u></b></p> <p>1) The chassis cab interior shall be wired with two (2) wiring bundles for connecting agency mobile radios.</p> <p>2) The bundles shall be separate from each other and terminate in Deutsch brand connectors. The antenna wires shall remain separate from the connector. A pigtail shall be included for each bundle for connecting the agency radio into the wiring harness. Each bundle including antenna wires shall be labeled RADIO 1 or RADIO 2. In addition, the individual wires in each pigtail shall be labeled (Battery Power, Ground, PA Input, etc.). The pig tails and antenna wires shall be a minimum of 3 feet or as long as required for installation of the radios.</p> <p>3) All connections shall be made to the battery. Blade</p>		



	<p>style fuse holders, using the same size fuses as the chassis, shall be installed in the pigtails for the constant power, but no fuses shall be installed.</p> <p>4) The location for the radio installation and radio wiring bundles shall be determined in conjunction with the NFEP, overhead shall not be acceptable.</p> <p>5) Wiring bundle for RADIO 1 shall consist of:</p> <ul style="list-style-type: none"> <li>a. Harness side connector: DT06-08SA</li> <li>b. Pigtail side connector: DT04-08PA</li> <li>c. One (1) Red 10-gauge constant power to the battery. This shall split into two (2) 14-gauge wires going into the cavities 1 and 2 on the connector.</li> <li>d. One (1) Red with Black Stripe 12 gauge connected to the chassis ignition, supplying power when either the vehicle ignition is in the "Auxiliary" or "Run" position. This shall split into two (2) 14-gauge wires going into the cavities 3 and 4 on the connector.</li> <li>e. One (1) Black 10-gauge ground wired direct to the battery. This shall split into two (2) 14-gauge wires going into the cavities 7 and 8 on the connector.</li> <li>f. One (1) set of 18-gauge wires connected to the radio audio input for the PA system consisting of two (2) Light Blue wires going into the cavities 5 and 6 on the connector. If polarity is needed with the audio input for PA System, the positive shall be solid (cavity 5) and the negative shall have a White Stripe (cavity 6)</li> <li>g. One (1) antenna lead which shall be labeled coiled and secured near the Radio 1 Connector</li> </ul> <p>6) Wiring bundle for RADIO 2 shall consist of:</p> <ul style="list-style-type: none"> <li>a. Harness side connector: DT06-06S</li> <li>b. Pigtail side connector: DT04-06P</li> <li>c. One (1) Red 10-gauge constant power to the battery. This shall split into two (2) 14-gauge wires going into the cavities 1 and 2 on the connector</li> <li>d. One (1) Red with Black Stripe 12 gauge connected to the chassis ignition, supplying power when either the vehicle ignition is in the "Auxiliary" or "Run" position. This shall split into two (2) 14-gauge wires going into the cavities 3 and 4 on the connector</li> <li>e. One (1) Black 10-gauge ground wired direct to the battery. This shall split into two (2) 14-gauge wires going into the cavities 5 and 6 on the connector</li> <li>f. One (1) antenna lead which shall be labeled</li> </ul>		
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	<p>coiled and secured near the Radio 2 Connector</p> <p>g. Radio body to be mounted under the back seat.</p> <p>7) The following two (2) radios supplied by Frederick-Firestone Fire Protection District shall be installed by the apparatus manufacturer:</p> <p>a. One (1) Bendix King mobile radio</p> <p>b. One (1) Motorola 6500 APX mobile radio</p>		
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**SECTION I- WARNING LIGHTS AND AUDIBLE WARNING**

<b>Item</b>	<b>Requirement</b>	<b>Comply (Y or N)</b>	<b>Exception (Y or N)</b>
A.	<p><b><u>ELECTRONIC SIREN</u></b></p> <p>1) One (1) Whelen 100/200-watt full function siren amplifier with microphone shall be supplied by Frederick-Firestone Fire Protection District. The control head shall be mounted in the floor mounted console in a location readily accessible to the driver/operator.</p>		
B.	<p><b><u>SPEAKER</u></b></p> <p>1) One (1) Federal Signal 100-watt speaker shall be mounted behind the heavy-duty front bumper/brush guard. The speaker shall be wired to the electronic siren control head and a customer specified mobile radio.</p>		
C.	<p><b><u>LIGHT BAR</u></b></p> <p>1) The front and front side zones shall be covered by one (1) Sound Off N Force full bar 60.00-inch-long LED light bar mounted on the cab guard approximately 2.00-inches above the cab roof to provide good visibility to the front and sides of the vehicle. The light bar shall have approximate dimensions of 60 inches long, 2.55-inches high without mounting feet, and 12.00inches wide. The LEDs shall be red/white/blue/amber. The Red on the driver's side and Blue will be on the passenger side. The Amber will be in the back. Alley lights will flash shall be wired so that it turns off when the parking brake is set. Two (2) white heads shall flash. The light bar shall be wired so that it turns off when the parking brake is set, to meet the NFPA requirements for blocking mode. The light bar wiring shall incorporate a quick disconnect feature to allow for the removal/replacement of the light bar in the event the OEM cab must be removed for repairs.</p>		

D.	<p><b><u>LOWER ZONE A WARNING LIGHTS</u></b></p> <p>1) Two (2) Sound Off M Power 7x3 red/blue split LED light head shall be mounted with the OEM chassis front grille, forward facing. Each light head shall have a clear lens and be mounted in a chrome flange. The light heads shall be controlled with the "EMERGENCY MASTER" switch located on the SPS panel in the chassis cab.</p>		
E.	<p><b><u>FORWARD ZONE B/D WARNING LIGHTS</u></b></p> <p>1) One (1) Sound Off M Power 7x3 red/blue split LED light head shall be mounted on each side of the chassis within the front fender, side facing. Each light head shall have a clear lens and be mounted in a chrome flange. The light heads shall be controlled with the "EMERGENCY MASTER" switch located on the SPS panel in the chassis cab.</p>		
F.	<p><b><u>AFT ZONE B/D WARNING LIGHTS</u></b></p> <p>1) One (1) Sound Off M Power 7x3 red/blue split LED light head shall be mounted on each side of the apparatus body within the apparatus body fender. The wiring for the light heads shall be routed in a manner that protects it from foreign debris during off-road driving conditions. Each light head shall have a clear lens and be mounted in a chrome flange. The light heads shall be controlled with the "EMERGENCY MASTER" switch located on the SPS panel in the chassis cab.</p>		
G.	<p><b><u>LOWER ZONE C WARNING LIGHTS</u></b></p> <p>1) One (1) Sound Off M Power 7x3 Blue/Amber LED light head shall be provided on the lower rear corner of the passenger side of the apparatus. One (1) Sound Off M Power 7x3 Red/Amber LED light head shall be provided on the lower rear corner of the driver side of the apparatus. Each light head shall be mounted in the top position of the Cast Products four-position bezel on each side of the apparatus. Each light head shall have a clear lens. The light heads shall be controlled with the "EMERGENCY MASTER" switch located on the SPS panel in the chassis cab.</p>		
H.	<p><b><u>UPPER ZONE C WARNING LIGHTS</u></b></p> <p>1) One (1) Sound Off M power 6X4 Red/Amber LED light head shall be installed on the rear face of the aluminum coffin box top outside corner independent module on the driver side of the apparatus. One (1) Sound Off M power 6X4 Blue/Amber LED light head shall be installed on</p>		

	<p>the rear face of the aluminum coffin box top outside corner independent module on the passenger side of the apparatus. Each light head shall have a clear lens and be mounted in a chrome flange. The light heads shall be controlled with the "EMERGENCY MASTER" switch located on the SPS panel in the chassis cab.</p>		
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**SECTION J- MISCELLANEOUS LABELS**

Item	<b><u>Requirement</u></b>	Comply (Y or N)	Exception (Y or N)
A.	<p><b><u>APPARATUS FLUID TYPES AND QUANTITIES</u></b></p> <p>1) A permanently mounted label, showing the recommended fluid types and quantities for the apparatus chassis and associated components, shall be provided in the apparatus cab interior near the driver’s seating position.</p> <p>2) This label shall list the recommended fluid types and quantities for the following components:</p> <ul style="list-style-type: none"> <li>a) Chassis Engine Lubricant</li> <li>b) Chassis Engine Coolant</li> <li>c) Chassis Power Steering Fluid</li> <li>d) Chassis Transmission Fluid</li> <li>e) Chassis Transfer Case Lubricant</li> <li>f) Chassis Drive Axle Lubricant</li> <li>g) Pump Gearbox Lubricant, if applicable</li> <li>h) Chassis Brake Fluid</li> </ul>		
B.	<p><b><u>SEATING CAPACITY</u></b></p> <p>1) The completed apparatus shall be designed to have a fully enclosed seat with an approved seat belt for each occupant. The term "fully enclosed" shall mean four sides, a top and a bottom, with an appropriate door for easy entrance to and exit from the seating position.</p> <p>2) A warning label, listing the seating capacity of the completed apparatus, shall be provided in the apparatus cab interior. This label shall be located so that it is visible from all seating positions.</p> <p>3) This apparatus shall have a seating capacity of two (2) personnel in front, and three (3) personnel in the rear for a total seating capacity of five (5).</p>		
C.	<p><b><u>SEATING</u></b></p> <p>1) The center portion of the 40/20/40 split-bench seat shall be removed to accommodate the installation of the center console.</p>		
D.	<p><b><u>SEAT BELT WARNING</u></b></p> <p>1) A warning label, stating: <b>"DANGER- Personnel Must Be Seated and Seat Belts Must Be Fastened While Vehicle Is in Motion or DEATH OR SERIOUS INJURY MAY</b></p>		

	<b>RESULT,”</b> shall be provided in the apparatus cab interior. This label shall be located so that it is visible from all seating positions.		
E.	<b><u>VEHICLE HEIGHT WARNING</u></b> 1) A warning label, listing the overall height, width, length and GVWR of the completed apparatus, shall be provided in the apparatus cab interior. This label shall be located so that it is visible from the driver’s seating position.		
F.	<b><u>FINAL STAGE MANUFACTURER VEHICLE CERTIFICATION</u></b> 1) A Final Stage Manufacturer vehicle certification label shall be provided and installed in the apparatus cab driver’s door jamb.		
G.	<b><u>NOISE HAZARD WARNING</u></b> 1) A warning label, stating: <b>“WARNING: Noise Hazards Occur During Siren Operation”</b> , shall be provided and installed in the apparatus cab interior. This label shall be located so that it is visible from all seating positions.		
H.	<b><u>“DO NOT MOVE APPARATUS” WARNING</u></b> 1) One (1) surface-mounted red LED light shall be provided in the center cab console, at the top, or most forward position. The light shall flash whenever a compartment door is "OPEN", and the parking brake is released. The light shall be wired directly into the door ajar switch and hazard circuit. The hazard warning light shall be marked with a label stating, <b>“DO NOT MOVE APPARATUS WHEN LIGHT IS ON.”</b>		

**SECTION K- EXTERIOR**

<b>Item</b>	<b>Requirement</b>	<b>Comply (Y or N)</b>	<b>Exception (Y or N)</b>
A.	<b><u>Front Bumper and Brush Guard</u></b> 1) The chassis shall be equipped with a Go Industries or Ranch Hand custom heavy-duty plate style front bumper/grill guard. The front bumper/grill guard shall meet the requirements of NFPA 1906 current edition. The front bumper/grill guard shall be designed so that it does not affect the chassis manufactures warranty. The front bumper/grill guard shall be designed so that it does not negatively affect the chassis approach angle. The front bumper/grill guard shall be equipped with provisions for winch mounting. The front bumper/grill guard shall be equipped with two (2) precut holes/grates to accommodate off-road driving light in a protected location. The front bumper/grill guard shall be equipped with two (2) integrated external tow eyes with a rated capacity sufficient to extricate the apparatus if		

	<p>necessary. Each tow eye shall be equipped with bolt-on D-Shackles with a rated capacity sufficient to extricate the apparatus if necessary. The weight of the front bumper/grill guard shall not exceed 175 lbs. All exterior surfaces of the entire grill guard assembly shall be coated with a minimum 1-2 mm flat black powder-coated finish. The front bumper shall contain a license plate mounting position with holes or a bracket for mounting.</p>		
B.	<p><b><u>Front Bumper Lights</u></b></p> <p>1) The lights to be mounted on the front bumper will be Firetech lights. These lights will be turned on by the up-fitter switches in the cab.</p> <ul style="list-style-type: none"> <li>a. Lower Bumper openings: <ul style="list-style-type: none"> <li>i. 6.7" CG2 Kit Clear: X2</li> <li>ii. Mount in bumper opening in the lower part of the bumper.</li> <li>iii. CG2-CPM1810KIT X2</li> <li>iv. Part #:9907444</li> <li>v. Raw Lumens:27,000</li> <li>vi. Effective Lumens:18,900</li> <li>vii. Wattage:252W</li> <li>viii. Amp Draw(@12V):21A</li> </ul> </li> <li>b. Top Bumper Spots: <ul style="list-style-type: none"> <li>i. Mount in middle of bumper in inside holes both sides</li> <li>ii. Item #: CG2-CPZ110KIT X2</li> <li>iii. Part #:9907468</li> <li>iv. Raw Lumens:6,000</li> <li>v. Effective Lumens:4,200</li> <li>vi. Wattage:80W</li> <li>vii. Amp Draw(@12V):6.67A</li> </ul> </li> </ul>		
C.	<p><b><u>Up Filter switch layout</u></b></p> <p>1) All scene lights and bumper lights are to be run off the upfitter switches in the cab.</p> <ul style="list-style-type: none"> <li>a. Switch 1 lower bumper lights</li> <li>b. Switch 2 bumpers outside the center bumper light</li> <li>c. Switch 3 bumpers inside the center bumper light</li> <li>d. Switch 4 driver-side scene light</li> <li>e. Switch 5 passenger scene light</li> <li>f. Switch 6 rear scene lights</li> </ul>		
D.	<p><b><u>Winch</u></b></p> <p>1) One (1) Warn electrically operated 16,500-pound shall be installed within the heavy-duty front bumper described elsewhere in this specification. The winch shall feature 80-feet of 3/8-inch Spydura Pro synthetic rope, an 18,000-pound capacity EPIC hook, and remote control/switch. The ground (-) for the winch is routed and secured to the ground (-) on the chassis' battery. The positive (+)/power for the winch is routed and secured to the positive</p>		

	(+)/power side of one (1) of the 150-amp circuit breakers underneath the chassis' hood. For the winch to "power up" the end user will need to plug the winch remote into the winch otherwise, the winch is not drawing any amperage.		
E.	<p><b><u>Rear Bumper</u></b></p> <p>1) The rear bumper shall be 3.00-inch tall by 8.00-inch deep and extend across the entire width of the apparatus. The bumper shall be fabricated from heavy duty steel tubing and shall be powder coated black. The top of the bumper shall be a 4F stainless-steel CNC punched and perforated non-skid resistant surface.</p>		
2)	<p><b><u>Apparatus Body</u></b></p> <p>1) The installation of hardware parts such as hinges, catches, handles, or knobs shall be accomplished to avoid damaging the hardware or the mounting surface. After fabrication, all parts shall be cleaned of the following: smudges; loose, spattered, or excess welding; metal chips or fillings; or any other foreign material which might detract from the intended operation, function, or appearance of the apparatus or its equipment. This would include any particles which could loosen or become dislodged during the normal expected life of the equipment. Whenever possible, this cleaning shall take place before the parts are assembled.</p> <p>2) Threaded parts or devices shall show no evidence of cross-threading, mutilation, or detrimental burrs. All screw type and rivet fasteners shall be tight to allow no relative movement between the attached parts. All bolts and screws shall not be tightened more than the SAE torque standard established for the grade, screw, and thread type. The entire body shall be removable in its entirety without the disassembly of any compartments, flooring, or other structural components.</p> <p>3) The body shall be designed to be approximately as wide as the outside wheel track on the rear axle. This will allow the apparatus to maneuver more easily in off-road environments. The body shall be approximately 95.00-inches wide from side to side at the rear of the apparatus.</p> <p>4) The top of the apparatus shall have a nonskid surface across the entire area. The non-skid shall be consistent along the tops of the body and be free of any dirt, grease, or foreign material. There surface directly under the independent body modules shall be a smooth gel coated finish to allow for a better seal between the bottom of the independent body modules and top of the body. Additionally, the top of the apparatus body shall support, without distortion, a walking person weighing up to 300 pounds.</p> <p>5) The entire apparatus body shall be an independent structure fabricated from bonded and molded fiber reinforced composite panels and compartments. The resin shall be thermoset and shall not be subject to distortion or loss of structural integrity at temperatures at minimum of 350° Fahrenheit. This shall provide a strong, lightweight, corrosion free structure that will withstand extremely high temperatures.</p>		

	<p>6) All fiberglass used in the construction of the body shall be grade “E” or “S,” and the resin to glass ratio shall be a 30/70 ratio average or higher. The glass reinforced polyester shall not be less than 3/16-inch thick at any point on the body. Additionally, all coring materials shall have a minimum covering of 1/8-inch thick glass and resin on either side. All coring for bulkheads, partitions, floors, compartments, and doors shall be either PVC-based, rigid, closed cell structural foam, or composite material. Wood is not acceptable. The apparatus manufacturer shall determine the proper thickness and foam density for each application.</p> <p>7) The fiber composite body shall allow for up to 30° flex off-center without causing body fatigue or component failure.</p>		
3)	<p><b><u>COMPARTMENT INTERIORS</u></b></p> <p>1) Each compartment shall have ¾-inch drain located in the rear of the compartment fitted with an easily removable rubber grommet closure.</p>		
2)	<p><b><u>APPARATUS BODY FRAME CONSTRUCTION</u></b></p> <p>1) The apparatus body and compartments shall be supported with a frame of channel or tubular aluminum members. The frame shall extend under the wheel well areas at the front and rear and shall be attached to the compartments. The crossmembers in the support system shall be spaced so that there is no more than ¼” of vertical deflection per 256 square inches when 250 lbs. are evenly distributed over 40 square inches. All tubular aluminum shall have a minimum wall thickness of 3/16” and any channel shall be a minimum of ¼ thick. The frame shall be constructed to become an integral portion of the apparatus body.</p> <p>2) The channel or tubular aluminum deck and compartment support frames shall be strong enough to support 5000 lbs. in the bed area and 1000 lbs. of equipment in each side compartment (the actual load capability of the completed apparatus may be limited by the GVWR).</p>		
3)	<p><b><u>BODY MOUNTING</u></b></p> <p>1) A spring-loaded body mounting system shall be used to mount the body to the chassis. This system shall be designed to allow independent movement between the body frame and the chassis frame protecting the module from the stresses and twisting rendered by the flexing of the chassis frame. As such, the body frame shall not rest on the chassis frame at any point. The mounts shall be pre-engineered for their intended use.</p> <p>2) All the mounting hardware (nuts, bolts, washers) required for complete body installation shall be Grade 8 for sizes ½-inch and smaller, and Grade 5 for sizes larger than ½-inch. All nuts shall be self-locking style. All mounting brackets shall be powder coated black.</p> <p>3) The body front shall be mounted utilizing fluorescent powder coated pre-engineering springs. The center mount shall consist of an 18-inch-long Delrin spacer mounted mid-length allowing the body frame to rest in a neutral position under full</p>		



	load. The rear body mounts shall be affixed via solid mounts to the chassis frame.		
4)	<p><b><u>VERTICAL SURFACES</u></b></p> <p>1) The vertical surface at the front of the body shall be covered with a minimum 1/8-inch-thick polished aluminum tread plate for appearance, wear, and enhanced visibility at night. The tread plate shall be designed so that joints are minimized and shall cover the entire vertical surface area. The tread plate shall also incorporate protection of the outboard corners and serve as corner scuff guards.</p> <p>2) The vertical surface at the rear of the body shall be covered with a minimum 1/8-inch-thick smooth aluminum for the application of the rear chevron striping described elsewhere in this specification. The aluminum panel shall be designed so that joints are minimized and shall cover the entire vertical surface area. The aluminum panel shall also incorporate protection of the outboard corners and serve as corner scuff guards.</p>		
5)	<p><b><u>GRAB HANDLES</u></b></p> <p>1) One (1) NFPA-compliant chrome-plated grab handle shall be provided and located at the rear of the body on the driver's side, one (1) mounted vertically on the rear-facing surface of the upper compartment, left of the control panel parallel to the outboard edge of the body, and two (2) 24" long handles mounted horizontally on top of each of the upper compartments, parallel to the outboard edges of the body.</p>		
2)	<p><b><u>REAR STEPS</u></b></p> <p>1) Two (2) NFPA-compliant fold down steps shall be provided and installed at the rear of the apparatus on the left side of the body. The steps shall be fabricated from heavy duty cast aluminum with spring assisted folded hinges. The top of the steps shall be an integral diamond point skid resistant surface that allows water to flow off the step without ice formation in cold weather use. The steps shall be offset bilaterally from each other approximately 12 inches to facilitate ease of climbing. The vertical distance from the bumper to the first step, between the two (2) steps and from the top step to the top of the apparatus shall not exceed 14 inches.</p> <p>2) One (1) warning plate shall be affixed to the rear of the apparatus body in a conspicuous location. The warning plate shall read "<b>WARNING: DO NOT RIDE ON REAR STEP WHILE VEHICLE IS IN MOTION. DEATH OR SERIOUS INJURY MAY RESULT.</b>"</p>		
3)	<p><b><u>DRIVER'S SIDE COMPARTMENTS</u></b></p> <p>1) The driver's side lower module of the apparatus body shall have approximate overall dimensions as specified. It shall consist of three (3) compartments, each with specified approximate clear depth behind the door when the door is shut. Each compartment</p>		

	<p>shall have a “flow through” vent provided to supply air flow and minimize moisture unless designated as fuel storage.</p> <ul style="list-style-type: none"> <li>a. Lower module dimension: 106" W x 20-1/2" D</li> <li>b. Clear Depth: 19-1/2"</li> </ul> <p>2) One (1) rescue style compartment shall be provided forward of the rear wheels, with approximate inside dimensions as specified. The door shall be vertically hinged and shall have approximate clear door opening as specified.</p> <ul style="list-style-type: none"> <li>a. Compartment dimension: 33" W X 39" H X 20-1/2" D</li> <li>b. Clear door opening: 26-1/2" W X 32" H</li> </ul> <p>3) One (1) compartment shall be provided center above the rear wheels, with approximate inside dimensions as specified. The door shall be a horizontally hinged, drop-down door, and have an approximate clear door opening as specified.</p> <ul style="list-style-type: none"> <li>a. Compartment dimension: 44" W X 22" H X 20-1/2" D</li> <li>b. Clear door opening: 42" W X 15" H</li> </ul> <p>4) One (1) compartment shall be provided aft of the rear wheels, with approximate inside dimensions as specified. The door shall be vertically hinged and shall have an approximate clear door opening as specified.</p> <ul style="list-style-type: none"> <li>a. Compartment dimension: 28" W X 39" H X 20-1/2" D</li> <li>b. Clear door opening: 20" W X 32" H</li> </ul> <p>5) The driver’s side independent upper module of the apparatus body shall have approximate overall dimensions as specified. The fit and trim of the upper module shall be integral with the lower compartments in both aesthetics and function. The module shall be constructed of a minimum 3/16-inch aluminum tread plate and all hinges, fasteners, latches, and other hardware shall be stainless-steel. The lid of the upper module shall be hinged on the outboard side of the apparatus and be held in the "OPEN" position with two (2) appropriately rated gas shocks and allows the lid to open at a 90-degree angle. The lid shall be secured with two (2) stainless-steel adjustable hasp-style latches. The lid of the module shall be NFPA 1906 compliant regarding a walking surface. The module shall be wired to the "DO NOT MOVE APPARATUS" light located on the cab console and a 48.00-inch LED compartment light shall be installed in a protected location. The floor of the module shall have black Dri-Dek matting and multiple drain holes shall be positioned in the floor. The module shall be mounted on black Delrin pads allowing the module to drain properly.</p> <ul style="list-style-type: none"> <li>a. Upper module dimension: 60" W X 17-1/2" H X 20-1/2" D</li> </ul>		
4)	<p><b><u>PASSENGER’S SIDE COMPARTMENTS</u></b></p> <p>1) The passenger's side lower module of the apparatus body shall have approximate overall dimensions as specified. It shall consist of three (3) compartments, each with specified approximate clear depth behind the door when the door is shut. Each</p>		

compartment shall have a “flow through” vent provided to supply air flow and minimize moisture unless designated as fuel storage.

- a. Lower module dimension: 106" W x 20-1/2" D
- b. Clear Depth: 19-1/2"

2) One (1) rescue style compartment shall be provided forward of the rear wheels, with approximate inside dimensions as specified. The door shall be vertically hinged and shall have approximate clear door opening as specified.

- a. Compartment dimension: 33" W X 39" H X 20-1/2" D
- b. Clear door opening: 26-1/2" W X 32" H

3) One (1) compartment shall be provided center above the rear wheels, with approximate inside dimensions as specified. The compartment shall be accessible from two (2) sides. The passenger's side door shall be a horizontally hinged, dropdown door, and have an approximate clear door opening as specified. The rear door shall be a horizontally hinged, dropdown door, and have an approximate clear door opening as specified. **Add a 65" LED compartment light. To be mounted to the top inside of the compartment. Light will shine on the back of the open cabinet door. Light will include a switch. Spray bed liner on the inside cabinet door.**

- a. Compartment dimension: 72" W X 22" H X 20-1/2" D
- b. Passenger side door opening: 67" W X 15" H
- c. Rear door opening: 12-1/2" W x 9-1/2" H

4) One (1) compartment shall be provided aft of the rear wheels, below the upper horizontal compartment, with approximate inside dimensions as specified. The door shall be vertically hinged and shall have an approximate clear door opening as specified.

- a. Compartment dimension: 28" W X 16-1/2" H X 20-1/2" D
- b. Clear door opening: 20" W X 11-1/2" H

5) The passenger's side independent upper module of the apparatus body shall have approximate overall dimensions as specified. The fit and trim of the upper module shall be integral with the lower compartments in both aesthetics and function. The module shall be constructed of a minimum 3/16-inch aluminum tread plate and all hinges, fasteners, latches, and other hardware shall be stainless-steel. The lid of the upper module shall be hinged on the outboard side of the apparatus and be held in the "OPEN" position with two (2) appropriately rated gas shocks and allows the lid to open at a 90-degree angle. The lid shall be secured with two (2) stainless-steel adjustable hasp-style latches. The lid of the module shall be NFPA 1906 compliant regarding a walking surface. The module shall be wired to the "DO NOT MOVE APPARATUS" light located on the cab console and a 48.00-inch LED compartment light shall be installed in a protected location. The floor of the module shall have black Dri-Dek matting and multiple drain holes shall be positioned in the floor. The module shall be mounted on black Delrin pads allowing the

	<p>module to drain properly.</p> <p>a. Upper module dimension: 60" W X 17-1/2" H X 20-1/2" D</p>		
5)	<p><b><u>SUCTION HOSE COMPARTMENT/ACCESS</u></b></p> <p>1) A horizontally hinged, drop-down door shall be located at the upper rear facing portion of the passenger side pack. The door shall be positioned as high as possible and shall have a small rubber bumper placed on the outside of the door to prevent contact with the fold down step when in the "OPEN" position. Three (3) aluminum square tubes shall be mounted as high as possible and transect the passenger side front compartment and passenger side long horizontal compartment. The tubes shall be mounted in a manner that allows each suction hose to be easily remove or stored with the foot valve and strainer attached.</p>		
6)	<p><b><u>COMPARTMENT DOORS</u></b></p> <p>1) All compartment doors shall be integral in design and recessed into the apparatus body sides, sized to provide easy access to all interior areas of the compartment. All doors shall be consistent in fit and finish with the apparatus body. All doors shall be weatherproof and maintain contact with all points of the weather stripping. Weather stripping shall be bulb type, attached to the opening flange of the compartment opening. The interior surface of the compartment door shall be a gel coat surface of a quality and uniformity equal to that of the exterior surface of the apparatus body. The compartment doors shall be cored with industrial grade closed cell PVC foam, or composite material, of the correct thickness.</p> <p>2) Red and white reflector DOT striping shall be installed on the interior surface of all vertically hinged doors.</p>		
7)	<p><b><u>DOOR HOLD OPEN DEVICES</u></b></p> <p>1) All vertically hinged, outward-opening compartment doors shall be provided with an over center door check to hold the door in the desired position. The door check shall be attached to the top of the door and fastened to a stainless-steel plate bolted into the body and door. The passenger side front compartment shall utilize a gas shock as the door opening device. This is used due to the full-length shelf pertaining to the hard-suction hose compartment. All vertically hinged, outward opening compartment doors shall be capable of being closed with one hand, allowing a free hand to hold equipment or supplies.</p> <p>2) Each horizontally hinged door shall be equipped with add-a-link style (removable) retainers and small rubber bumpers installed on the body fenders to allow full 180 degree opening for improved access into the compartment. A piece of black heat shrink shall be utilized over the crimp.</p> <p>3) All horizontally hinged, overhead lift-up, outward opening compartment doors shall be provided with two (2) extending, gas cylinder type hold open devices, one (1) mounted vertically on each side of the compartment door opening. The pressure rating of</p>		

	<p>the gas cylinders shall be carefully matched to the size and weight of the compartment door and shall hold the compartment door securely open to a greater than 90° angle without additional support. The gas cylinder hold openers shall dampen the upward movement of the compartment door while opening and shall permit the closing of the compartment door without the need to release any type of manual locking devices. All horizontally hinged, overhead lift-up compartment doors shall be capable of being closed with one hand, allowing a free hand to hold equipment or supplies.</p>		
8)	<p><b><u>STAINLESS STEEL D-RING SLAM LATCHES</u></b></p> <p>1) Unless were noted, all compartment door latch assemblies shall be installed with threaded fasteners, shall not be welded, and shall be easily removable for servicing or replacement. All door latch assemblies shall be of a flush-mount, "D-Handle" design, with all external components fabricated from polished stainless steel. All latches shall be of a two-step slam-type design, with a single-point latching operation. Matching striker bolts shall be utilized with all latch assemblies. All striker bolts shall have slotted mounting holes and shall be attached with bolts to captive steel plates in the body structure for strength and ease of adjustment. The strikers shall be installed on a level axis and shall not be crooked. Welded striker bolts or plates shall not be acceptable.</p> <p>2) All hardware shall be corrosion resistant and suitable for its intended use. All nuts and bolts shall be stainless steel. Stainless steel nuts shall be the self-locking type. Each lock shall be configured so that in the vertical position it is "UNLOCKED" and in the horizontal position it is "LOCKED". A minimum of ten (10) keys shall be provided with the apparatus upon delivery.</p>		
9)	<p><b><u>COMPOSITE ADJUSTABLE SHELF CHANNELS</u></b></p> <p>1) Vertically mounted composite shelving tracks shall be provided and installed in all enclosed body compartments, except passenger's side lower rear compartment, for the current or future installation of infinitely-adjustable shelving, slide out trays or equipment brackets. The composite tracks shall allow for the shelves to be adjustable every two inches vertically utilizing nylon reinforced composite shelving standards with embedded stainless lock nuts.</p>		
10)	<p><b><u>SHELVING CONSTRUCTION AND LAYOUT</u></b></p> <p>1) Each shelf shall be one-piece pultruded fiberglass with nylon reinforced composite end caps and provision for dividers on 2.00-inch centers. Shelves shall be designed to maximize usable space within the compartment, prevent items from sliding off, and be adjustable. Shelves shall be capable of supporting a minimum 250 pounds unsecured load without being damaged or permanently distorted.</p> <p>a. Street Side Front: – Three (3) adjustable shelves</p>		

	<ul style="list-style-type: none"> <li>b. Curb Side Front: – Two (2) adjustable shelves</li> <li>c. Street Side Center: – One (1) adjustable shelf</li> <li>d. Curb Side Center: – One (1) adjustable shelf</li> <li>e. Street Side Rear: – Two (2) adjustable shelves</li> <li>f. Curb Side Rear: – Open</li> </ul>		
11)	<p><b><u>COMPARTMENT FLOOR MATS</u></b></p> <p>1) All enclosed side body compartments shall have floor mats installed in them, custom cut to fit the compartment floors. The floor mats shall be black in color and shall be easily removable to allow the compartment to be cleaned. The floor mats shall be designed to provide ventilation to the equipment stored in the compartment, and to protect the stored equipment from direct contact with the metal compartment floor surfaces. Turtle Tile® or Dri-Deck® brand floor mats meet this requirement</p>		
12)	<p><b><u>SHELF DIVIDERS AND RETENTION CLIPS</u></b></p> <p>1) One (1) package of shelf dividers and retention clips shall be provided for each shelf described elsewhere in this specification.</p>		
13)	<p><b><u>DRIP TORCH TRAY AND HOLDERS</u></b></p> <p>1) A drip torch tray capable of securely holding two drip torches upright shall be installed in the driver side rear compartment. The drip torch tray shall be constructed from aluminum or stainless steel. The design of the drip torch tray shall include a “wrap around” holder to secure the torches on rough terrain. The wrap around holder shall have the following dimension: diameter of 6.50-inches, height of 9.00-inches, with a slot opening of 2.50-inches, approximately 45-degree, to allow access to the drip torch handle. The tray shall act as a catch pan for spilled fuel and be removable to drain the spilled fuel. There shall be a retention system to allow the drip torch tray to be transferred from the designated fuel compartment to the rear bumper on the passenger side to allow the tray to be used temporarily from the bumper position during fire suppression efforts. In addition to the “wrap around” holder, the tray shall have a spring holder retention system to secure the drip torches to the tray, both in the stored configuration and the deployed configuration (i.e. torch wand and wick deployed).</p>		
14)	<p><b><u>PUMP AREA COVER (WALK-OVER) WITH HINGED ACCESS</u></b></p> <p>1) The apparatus shall be equipped with a removable plumbing area cover. <b>This cover shall cover the entire pump area.</b> All materials used in the construction and mounting of the cover shall be non-corrosive. The cover shall be fabricated of 3/16-inch aluminum CNC punched walking surface with an aluminum 2 inch by 2 inches by 3/16-inch square tube support frame. The tube</p>		

	<p>frame shall be fully removable for ease of pump system maintenance. The top of the cover shall be designed to provide a walkway access across the rear of the apparatus and provide shielding from the pump and plumbing manifold area. The cover shall open in the center, gull wing style, with stainless steel hinges on the outboard positions to allow easy access to the plumbing area without the use of tools. The cover shall be capable of supporting, without distortion, a walking person weighing up to 300 lbs. The walking surface shall comply with NFPA 1906. The hinged covers shall have hand railing on either side of the covers to aide in climbing and walking on top the vehicle. The cover shall be mounted and attached securely for travel in the off-road environment. There shall be a positive locking pins permanently attached, with stainless steel aircraft cable, to the structure to maintain closure.</p>		
<p>15)</p>	<p><b><u>WHEEL WELL AREA</u></b>  1) The inside of each wheel well shall be lined with three (3) separate pieces of minimum 18-gauge stainless steel sheet material to protect the underside of the entire body wheel well area. Each sheet shall be attached with stainless steel screws or bolted with self-locking nuts. The use of rivets shall not be acceptable.</p>		
<p>16)</p>	<p><b><u>BODY SCUFF GUARDS</u></b>  1) Scuff guards shall be provided and installed on the bottom horizontal edges of the body, both forward and aft of the rear wheel well openings. The scuff guards shall be fabricated from .063" polished aluminum tread plate. Rear Cab Protection  2) One (1) cab protection rack shall be fabricated and installed at the forward end of the apparatus body, directly behind the cab. The horizontal top bar and upright legs of the rack shall be fabricated from aluminum 2" X 2" square tubing welded to a 3/8" X 3" aluminum flat bar base. Aluminum expanded metal shall be welded to this framework to prevent rattling and drain holes shall be provided at the base of the lower horizontal bar and upright bar. The top of the rack shall conform to the shape of the chassis cab and be removable in event the chassis cab must be removed. The rack shall be powder coated matte black.</p>		
<p>17)</p>	<p><b><u>AIR COMPRESSOR</u></b>  1) A Viair Corporation ultra-duty air compressor system, or similar, shall be installed in the passenger front compartment forward of the rear wheels. One (1) quick disconnect air outlet shall be installed on the operator's panel and one (1) quick disconnect air outlet shall be installed near the air compressor in the specified compartment. The compressor shall have an "ON/OFF" switch, tire inflation gun with 200 PSI gauge and 30' coiled hose.  2) A 2.5-gallon air storage tank shall be supplied on the passenger side of the apparatus in a protected and easily accessible location.</p>		

18)	<p><b><u>GEAR STORAGE BOX AT FRONT OF WATER TANK</u></b></p> <p>1) A storage compartment fabricated from 1/2-inch protection series III polypropylene shall be a component of the water tank assembly, located at the front of the apparatus. The storage compartment shall have approximate dimensions of 46 inches long by 16 inches wide by 25 inches deep. A drain shall be provided in the bottom of the compartment that vents through to the ground. The compartment shall have a polypropylene overlapping style lid with two (2) adjustable overlapping positive catch style lockable latches, one (1) per side. The storage compartment shall be adequately sealed to prevent water intrusion. The lid shall be equipped with two (2) extending, gas cylinder type hold open devices. The lid shall not contact the light bar when "OPEN".</p>		
19)	<p><b><u>ICE CHEST STORAGE</u></b></p> <p>1) The top deck of the tank assembly shall have an integrated ice chest storage space with eyelets to attach tie down straps. Minimum dimensions for the ice chest storage assembly shall be 30.5 inches long, 16 inches wide and 6 inches deep. The space shall be designed to allow the user to drain the ice chest without removing the chest from the storage space. The drain shall be provided in the bottom of the box to allow moisture to drain through the tank to the ground.</p>		
20)	<p><b><u>SPARE TIRE STORAGE</u></b></p> <p>1) A storage compartment for one (1) spare tire shall be provided on the rear deck attached to the water tank. It shall be located towards the right side of the apparatus beside the pump. The storage compartment shall store the tire flat. The tire compartment shall have approximate dimensions of 36.25 inches wide by 14 inches tall by 36.50 inches deep. The compartment shall have a door constructed from polypropylene and all associated hardware shall be stainless steel. The compartment door shall utilize a stainless-steel D-Ring latch and shall be lockable using the same key number described elsewhere in this specification (1250).</p> <p>2) A mounting system shall be installed in the compartment to secure the 12-ton hydraulic jack and lug wrench / breaker bar.</p>		
21)	<p><b><u>CHAINSAW COMPARTMENT</u></b></p> <p>1) The tank assembly shall include an integrated lockable chainsaw compartment at the rear of the vehicle, below the operator's pump panel. The compartment shall have an approximate inside dimensions of 14.00-inches high by 14.00-inches wide by 50.00-inches deep. The compartment interior shall require a means of protecting the poly construction from the teeth of the chain saw, which may cut the poly during placement, removal, and storage. There shall be a retention mechanism to secure the saw into place once the saw has been stowed. The compartment shall be vented on the driver side of the wall of the compartment. The compartment door shall utilize a stainless-steel D-Ring latch and shall be lockable using the same key number</p>		



	described elsewhere in this specification (1250). The door shall seal the compartment from all outside elements. The floor area of the compartment shall be equipped with a removable stainless-steel drip pan to house the power head of the saw. The drip pan shall be designed to avoid damage to the bar/chain of the saw.		
22)	<p><b><u>TAILLIGHT ASSEMBLY</u></b></p> <p>1) One (1) four taillight assembly shall be mounted on each side of the rear panel, two (2) assemblies total, as low as possible without affecting the functionality of the rear bumper and bumper skin. Each assembly shall consist of a Sound Off M Power 7x3 red LED stop/taillight, a Sound Off M Power 7x3 amber LED arrow turn signal light, a Sound Off M Power 7x3 emergency flasher described elsewhere in this specification, and a Sound Off M Power 7x3 back up light described elsewhere in this specification. Each light shall be approximately 7 inches wide by 3 inches tall. All four (4) lights shall be mounted together in a polished aluminum four light surface mount vertical bezel.</p> <p>2) Taillight Assembly Layout:</p> <ol style="list-style-type: none"> <li>a. Emergency LED Flasher</li> <li>b. Red LED Stop/Tail Light</li> <li>c. Amber LED Arrow Turn Signal</li> <li>d. Back Up Light</li> </ol>		
23)	<p><b><u>LICENSE PLATE BRACKET AND LIGHT</u></b></p> <p>1) Two (2) bolts shall be appropriately spaced to accept a standard Government furnished license plate on the driver side rear of the apparatus. The bolts shall be securely fastened to the rear panel and two (2) addition nylon locking nuts shall be supplied on the bolts to secure the license plate. One (1) clear LED light shall be provided directly above the mounting location to illuminate the license plate.</p>		
24)	<p><b><u>CLUSTER/CLEARANCE LIGHTS AND REFLECTORS</u></b></p> <p>1) Three (3) round ICC red LED clearance lights shall be located at the rear of the apparatus above the bumper. Two (2), one (1) per side, round ICC red LED clearance lights shall be on the upper sides of the body. Two (2), one (1) per side, round ICC amber LED clearance lights shall be installed on the front of the body.</p> <p>2) Additional lighting shall be provided to conform to DOT, Federal and NHTSA specifications for vehicles of 80.00-inches wide. All lighting shall be compatible with the 12-volt chassis electrical system. Lighting shall be located according to ICC regulations.</p>		
25)	<p><b><u>ADJUSTABLE WORK LIGHTS</u></b></p> <p>1) Two (2) LED Firetech swivel work lamps shall be mounted on the right and left sides of the rear cab protection. Each lamp shall be controlled independently by a switch located on the SPS panel and with a toggle switch located on the work lamp. The</p>		

	<p>work lamp(s) shall have the capability to rotate a full 360 degrees on both horizontal and vertical axis. The mounting height will be compatible with a person standing on the ground and will not block the view of the light bar. Each work lamp shall be painted to match the color of the apparatus. Beam Pattern should be the combination.</p> <p>2) Swivel Work Lights:</p> <ul style="list-style-type: none"> <li>a. <b>Part #:</b> FT-WL-X-9-FT-W-SH2</li> <li>b. <b>Wattage:</b> 63w</li> <li>c. <b># of LEDs:</b> 9 LEDs</li> <li>d. <b>Voltage Range:</b> 9-32v DC</li> <li>e. <b>Total Amperage @ 12V DC:</b> 5.25A</li> <li>f. <b>RAW Lumens:</b> 7200 Lumens</li> <li>g. <b>Effective Lumens:</b> 5,734 Lumens</li> </ul>		
26)	<p><b><u>COMPARTMENT LIGHTING</u></b></p> <p>1) Each compartment shall have continuous LED light strips. The LEDs and electronics shall be enclosed in a 5/8-inch diameter Lexan tube that is sealed at both ends with rubber caps to create a waterproof environment and be suitable for mounting in a wet location. The tube shall rotate to adjust the beam direction as required. The lighting shall be secured with molded nylon mounting clips. The lighting in all compartments shall start at the bottom of the compartment and extend up the sides and across the top to provide lighting around the perimeter of the compartment.</p> <p>2) Placement of the light strips shall be such that they are protected from being impacted by compartment contents or during removal/placement of equipment. The purpose of the LED strip lighting is to provide even lighting throughout the compartment while minimizing shadows and dark zones caused by shelving or equipment stored in the compartment. The lighting shall carry a five (5) year warranty.</p>		

**SECTION L- PUMP**

A.	<p><b><u>PUMP/AUXILIARY MOTOR</u></b></p> <p>1) A Waterax BB-4 fire pump, powered by a Kubota model D902, 24.8 HP four-cycle, water-cooled diesel engine, or similar, shall be provided and fixed mounted in the rear compartment. The pump shall be equipped with a 12-volt gear driven electric starter that is controlled from the pump operator's panel and a USFS-qualified spark arrestor.</p> <p>2) The auxiliary pump/engine shall be equipped with an automatic water pressure and oil pressure safety systems. The water pressure switch shall be designed to kill the pump engine when water pressure drops below 20 pounds per square inch. A toggled override switch located on the pump panel with cover shall be incorporated into the system for use during initial set up and/or drafting operations. The oil pressure switch shall be designed to kill the pump engine when oil pressure drops below 10 pounds per square inch. This safety shall be a programmed feature within the</p>		
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	LOFA Industries EP250 panel.		
B.	<p><b><u>PUMP SPECIFICATIONS</u></b></p> <p>1) As installed on the apparatus, the pump shall be capable of delivering 50 gallons per minute minimum at 250 pounds per square inch output pressure from a 5-foot lift through 24 feet of 2.50-inch suction hose with a strainer and from the apparatus water tank.</p> <p>2) In addition, the pump manufacturer shall certify that the pump can deliver the following capacities as measured at the pump head and at net pump pressure from draft under test conditions listed:</p> <p style="padding-left: 40px;"><i>a. Capacities:</i></p> <ul style="list-style-type: none"> <li>i. 105 gallons per minute @ 150 pounds per square inch net pump pressure</li> <li>ii. 70 gallons per minute @ 250 pounds per square inch net pump pressure</li> <li>iii. 40 gallons per minute @ 300 pounds per square inch net pump pressure</li> <li>iv. Tested under the following conditions: <ul style="list-style-type: none"> <li>v. An elevation of not more than 2000 feet above sea level</li> <li>vi. Through a single intake with 20 feet of 3.00-inch suction hose equipped with a suction hose strainer</li> <li>vii. With a lift of 5 feet</li> <li>viii. At 29.9" Hg atmospheric pressure (corrected to sea level)</li> <li>ix. At a water temperature of 60°F</li> </ul> </li> </ul>		
C.	<p><b><u>FUEL SUPPLY</u></b></p> <p>1) The engine shall be piped to the chassis fuel system with provisions to prevent fuel drain-back to the tank when the engine is shutdown. The pickup tube shall be located 1.00-inch from the bottom of the tank to leave sufficient fuel in the tank for movement of the vehicle.</p>		
D.	<p><b><u>FUEL PRIME</u></b></p> <p>1) A fuel re-prime pump shall be provided to assist in fuel delivery to the diesel engine from the chassis tank.</p>		
E.	<p><b><u>LUBRICATION</u></b></p> <p>1) Pressure feed with spin-on filter.</p>		
F.	<p><b><u>PUMP CONTROLS AND STARTER</u></b></p> <p>1) Controls for the pumping system shall be integrated into a single system that contains monitoring and protection features, and shall be configured with high current key switch, hour meter,</p>		

	voltmeter, oil pressure gauge, temperature gauge, throttle and spare openings for additional 2.00-inch diameter gauges. The starter and associated 12-volt, 40-amp alternator shall be hardwired to the chassis electrical system and controlled from the operator's panel.		
G.	<p><b><u>EXHAUST</u></b></p> <p>1) A USFS qualified spark arrestor shall be provided on the engine exhaust system. The exhaust shall be positioned to provide clear access to the air filter without the use of tools. The exhaust shall be routed away from the panel operator position and terminate behind the passenger side booster hose reel.</p>		
H.	<p><b><u>AIR INTAKE</u></b></p> <p>1) An air cleaner is to be provided with easy access to remove the element. An ember screen shall be provided on the inlet to the air cleaner.</p>		
I.	<p><b><u>SHIELDING</u></b></p> <p>1) There shall be custom fabricated polished aluminum tread plate safety shield(s) to prevent damage or injury if the potential exists for loose clothing, hands, or foreign objects to enter the cooling fan area, belts, or any other moving parts of the auxiliary pump. A warning plate shall be permanently affixed to the top of the pump engine cover that shall read "<b>WARNING: NOT A STEP</b>".</p>		
J.	<p><b><u>MAINTENANCE</u></b></p> <p>1) All serviceable items such as air filters, oil filters, drains, and fuel pumps shall be accessible for routine maintenance without requiring removal of any plumbing or major engine components such as complete removal of the exhaust system or air filter housing.</p>		
K.	<p><b><u>WARRANTY</u></b></p> <p>1) The engine driven (auxiliary) pump shall carry a minimum two (2) year warranty that covers labor charges from the date the pump is placed into service. The manufacture of the diesel engine that drives the auxiliary pump shall warrant the product for a minimum of 24 months or 2000 hours.</p>		
L.	<p><b><u>OPERATOR'S PANEL</u></b></p> <p>1) All pump engine controls and indications described elsewhere in these specifications shall be contained in a stainless-steel pump panel located at the rear of the apparatus. The pump panel shall be positioned so that the controls are easily operated by a person standing on the ground at the rear of the unit. The panel shall be structurally capable of holding a 300 lb. person standing on the top when installed on the unit. The rear of the panel shall be partially enclosed for added protection from the environment. The panel shall be equipped with a swing out access door that opens out, towards the pump operator, for easy field access to wiring and other components.</p>		

	<p>2) The panel shall be able to swing open to a minimum of 90 degrees for service and inspection.</p> <p>3) The panel shall be constructed from 14-gauge 4F "satin" finish stainless steel.</p>		
M.	<p><b><u>PANEL LIGHTING</u></b></p> <p>1) The panel shall be illuminated by one (1) LED light strip under a hood formed by the top of the pump panel. The light strip shall have a quick disconnect so it can be removed from the panel easily for replacement.</p> <p>2) One (1) OnScene Solutions 18.00-inch LED light strip shall be installed on the back of the pump operator's panel running vertically and serve as plumbing lights. The LEDs and electronics shall be enclosed in a 5/8-inch diameter Lexan tube that is sealed at both ends with rubber caps to create a waterproof environment and be suitable for mounting in a wet location. The LEDs shall be in a row one inch apart and have a beam angle of 120-degrees. The tube shall rotate to adjust the beam direction as required. The light shall fit in a 20.00-inch space and be secured with two (2) molded nylon mounting clips.</p> <p>3) The operator panel lights shall be controlled by the same switch located and labeled on the operator's panel.</p> <p>4) The operator's panel shall contain the following controls and gauges:</p> <ul style="list-style-type: none"> <li>a. Discharge pressure gauge</li> <li>b. Intake pressure gauge</li> <li>c. Electronic water level indicator</li> <li>d. Panel light switch</li> <li>e. Master drain handle</li> <li>f. Gauge drain valve</li> <li>g. Foam system controls</li> <li>h. The pump primer control</li> <li>i. Throttle</li> <li>j. Winterization air inlet</li> <li>k. Low voltage indicator light and alarm</li> <li>l. Horn activation switch/button, labeled "HORN"</li> <li>m. LOFA panel with the following</li> <li>n. Tachometer</li> <li>o. Analog Hour meter (BFX Installed)</li> <li>p. Oil pressure gauge</li> <li>q. Water Temperature gauge</li> <li>r. Voltmeter</li> <li>s. Glow plug light</li> <li>t. Engine "ON/OFF/START" and glow plug switch/light</li> <li>u. Low water pressure override switch, labeled "PRESSURE OVERRIDE"</li> </ul> <p>5) All gauges, controls, discharges and suction shall be labeled. All knobs on all valve handles shall have Loctite in place to prevent them from coming loose during off-road operation.</p>		
N.	<b><u>HORN/SIREN FEATURE</u></b>		

	<p>1) A switch shall be located on the pump panel to activate the chassis horn or the PA system air horn. The switch shall be marine style sealed momentary switch with a chrome button protector ring to aide in the prevention of accidental impact. The switch shall be labeled "HORN". Adjacent to the switch, behind the swing out panel, in an easily identifiable location, the circuit for this switch shall be fused and labeled to disable the horn in the event of a switch failure.</p>		
O.	<p><b><u>PLUMBING COMPONENTS</u></b></p> <p>1) All pump compartment components, including wiring, gauges, pump panel rear surfaces, high pressure hoses, and small diameter tubing, shall be left unpainted for rapid identification and ease of repair.</p>		
P.	<p><b><u>MAIN PUMP DISCHARGE AND INTAKE PLUMBING</u></b></p> <p>1) The discharge and intake valves specified shall be either of a direct-actuated quarter turn design or shall be provided with control rods that are directly connected from the valve handle to the rear mounted pump panel.</p> <p>2) All discharges and intakes shall have brass chrome rocker lug style bleed caps with stainless steel jacketed aircraft cable. All valves shall be Akron Brass fire service valves. All valves shall be designed to operate under normal conditions up to 500 PSI and shall have dual seats to work in both pressure and vacuum environments.</p> <p>3) All valves and controls shall be easily accessible for service, repair, or replacement. All valves shall be labeled "OPEN" or "CLOSED" unless the valve handle is parallel to the run of pipe when "OPEN" and perpendicular to the run of pipe when "CLOSED".</p> <p>4) Where vibration or chassis flexing may damage or loosen piping, the piping shall be equipped with Victaulic couplings.</p> <p>5) The main suction and discharge plumbing shall be welded stainless steel pipe or high-pressure flexible hose with appropriate fittings designed to withstand the normal operating pressures of the pump. All high-pressure hose shall be installed with a swivel or Victaulic coupling on at least one end of the hose. Pump-to-Plumbing vibration isolation shall be provided by using either flexible hose connections or two (2) Victaulic couplings on the intake and discharge of the pump. The nominal sizes of all the plumbing supplying the pump and discharges shall be as follows:</p> <ul style="list-style-type: none"> <li>a. Main suction - 2-1/2-inch NH</li> <li>b. Discharges - Stainless Steel pipe to be 2 inches and reduced to 1-1/2-inch NH at the valves</li> <li>c. Hose reel - 1-inch NPSH</li> </ul>		
Q.	<p><b><u>MASTER DRAIN</u></b></p> <p>1) The apparatus shall be equipped with a Waterous master drain valve shall be plumbed to the pump, suction plumbing and discharge plumbing as required to fully drain the piping and pump</p>		

	to prevent damage from freezing. The drain valve and associated plumbing will be designed to withstand pressures of 600 PSI. The master drain shall be labeled "NO 11 PUMP AND PLUMBING DRAIN".		
R.	<p><b><u>PUMP OPERATING INSTRUCTION PLATE</u></b></p> <p>1) An identification plate shall be provided on the pump operator's panel with which indicates valve position ("O" = open, "X" = close) for the following operations:</p> <ul style="list-style-type: none"> <li>a. Tank to Fire</li> <li>b. Suction to Fire</li> <li>c. Suction to Tank</li> <li>d. Drain Plumbing</li> <li>e. Drain Tank and Plumbing</li> <li>f. Prime</li> </ul>		
S.	<p><b><u>TEST GAUGE CONNECTIONS</u></b></p> <p>1) The plumbing system shall be provided with two (2) test ports on the pump panel exterior; one (1) plumbed to the intake side and one (1) plumbed to the discharge side of the water pump. These test ports shall be installed to provide a means for connecting certified test gauges when testing the pump's performance.</p>		
T.	<p><b><u>WINTERIZATION PORT</u></b></p> <p>1) A brass 1/4-turn valve shall be provided at the operator's panel and fitted with a universal air quick coupling plug to allow for pressurization of the plumbing system for efficient winterization.</p>		
U.	<p><b><u>DISCHARGE PRESSURE GAUGE</u></b></p> <p>1) One (1) four (4) inch diameter 0-600 PSI glycerin-filled discharge pressure gauge shall be provided on the operator's panel, located in a vertical pattern on the right side of the operator's panel above the intake pressure gauge. The glycerin in the bourdon tube shall be retained by a flexible rubber plug. The gauge shall be equipped with a drain cock (vent) at the gauge connection and shall be illuminated by the standard panel lighting.</p>		
V.	<p><b><u>INTAKE PRESSURE GAUGE</u></b></p> <p>1) One (1) four (4) inch diameter -30 - 0 - 300 PSI intake pressure gauge shall be provided on the operator's panel, located in a vertical pattern on the right side of the operator's panel below the discharge pressure gauge. The gauge shall be equipped with a drain cock (vent) at the gauge connection and shall be illuminated by the standard panel lighting.</p>		
W.	<p><b><u>PUMP COOLER/BY-PASS</u></b></p> <p>1) A pump cooler/by-pass line labeled "PUMP BYPASS" shall be plumbed from the discharge side of the pump to the water tank fill tower to help cool the pump when it is engaged, and water is not being discharged. This line shall be plumbed through a</p>		

	<p>quarter-turn panel-mounted ball valve. The valve shall be labeled “OPEN” and “CLOSED” and a warning label shall be affixed near the valve that states “PUMP DAMAGE CAN OCCUR IF VALVE IS CLOSED”. The valve handle position shall be vertical when "OPEN" and horizontal when "CLOSED". Water flow shall be between 1 and 1.5 GPM at 150 PSI pump pressure. A check valve shall be included in the line to facilitate priming.</p>		
X.	<p><b><u>ELECTRONIC WATER LEVEL INDICATOR</u></b></p> <p>2) Two (2) tank indicator kits shall be installed. One (1) on the pump panel and one (1) in the cab on the console. The one in the cab will turn on when the bump is in gear or an on/off switch in the cab. The kit shall include an electronic indicator module, a pressure sensor, and a 10' sensor cable. The indicator shall show the volume of water in the tank on nine (9) easy to see super bright LEDs. A wide view lens over the LEDs shall provide for a viewing angle of 180 degrees. The indicator case shall be waterproof, manufactured of aluminum, and have a distinctive blue label.</p> <p>3) The program features shall be accessed from the front of the indicator module. The program shall support self-diagnostics capabilities, self-calibration, and a data link to connect remote indicators. Low water warnings shall include flashing LEDs at 1/4 tank, down chasing LEDs when the tank is almost empty, and an output for an audio alarm.</p> <p>4) The indicator shall receive an input signal from an electronic pressure sensor. The sensor shall be mounted from the outside of the water tank near the bottom. No probe shall place on the interior of the tank. Wiring shall be weather resistant and have automotive type plug-in connectors.</p> <p>5) The indicator shall be calibrated at the time of inspection.</p>		
Y.	<p><b><u>PRIMER</u></b></p> <p>1) One (1) positive displacement, oil less, rotary vane, electric motor-driven priming pump, conforming to the NFPA requirements, shall be provided and installed on the cross member, above the lower edge of the frame rails, aft of the cab body. The primer pump body shall be fabricated from heat-treated anodized aluminum for wear and corrosion resistance. The priming pump shall be capable of producing a minimum of 17 inches Hg of vacuum at 2000 feet above sea level.</p> <p>2) The primer pump electric motor shall be of a 12 VDC totally enclosed design. The priming pump shall not require lubrication from an external source. The priming pump shall be operated by a single push-pull control valve mounted on the pump operator’s panel. The control valve shall be of all bronze construction and labeled "#6 Primer".</p> <p>3) The primer shall be connected to the priming port provided on the top of the pump inlet.</p>		
Z.	<p><b><u>INTAKE LOCATIONS</u></b></p> <p>1) All suction side plumbing shall be 2.50-inch in diameter unless otherwise noted.</p>		



	<p>2) One 2.50-inch tank to pump line, with an inline valve, shall be installed between the water tank outlet and the pump inlet, as close as possible to the water tank outlet. The valve shall have a T-handle control at the rear of the apparatus. <b>A 12-volt heating device is to be put on the discharge side of the valve. Switch on the pump panel.</b></p> <p>3) One (1) 2.50-inch diameter rear suction shall be provided. The suction shall be directed towards the rear of the unit and shall be easily accessible from the rear of the apparatus. It shall have a fire service valve with a 2.50-inch NH flange, a polished chrome rocker lug cap, and jacketed stainless-steel aircraft cable retainer.</p>		
AA.	<p><b><u>STAINLESS INTAKE STRAINER</u></b></p> <p>1) The pump intake shall be equipped with a stainless-steel wye strainer with 3/16-inch mesh to filter out foreign material and keep debris from entering the pump. The strainer will be removable and have a screw-off cap to allow easy cleaning of the filter element in the field. The plumbing shall have two (2) Victaulic couplings between the strainer and the pump for ease of service on the pump.</p>		
BB.	<p><b><u>DISCHARGE LOCATIONS</u></b></p> <p>1) All main discharge plumbing shall be 2.00-inch and reduced to 1.50-inch at the valves.</p> <p>2) One (1) 1.50-inch pump-to-tank, or tank fill, labeled "NO. 2 PUMP TO TANK, shall be supplied. The line shall have a fire service valve. The valve shall be accessible from the operator's position and controlled by a direct actuation handle. A check valve shall be positioned in the refill line beyond the valve and adjacent to the tank.</p> <p>3) One (1) 1.50-inch discharge, labeled "NO. 3 DISCHARGE", shall be supplied. The discharge shall be directed towards the rear of the unit. The discharge shall have a fire service valve locally controlled by a direct actuation handle. The discharge shall terminate with a 1.50-inch male NH threads with a chrome rocker lug cap and jacketed stainless-steel aircraft cable retainer.</p> <p>4) One (1) 1.50-inch water-only discharge, labeled "#19 WATER ONLY", shall be provided at the rear of the apparatus. The plumbing design shall prevent the back flow of foam contaminated water into the water-only discharge. The discharge shall be plumbed with stainless steel pipe and shall terminate with a 1.50-inch male NH threads with a chrome rocker lug cap and jacketed stainless-steel aircraft cable retainer.</p> <p>5) One (1) 1.00-inch central single hose reel control with valve shall be provided. The valve shall be easily accessible from the standing position at the rear of the apparatus. For additional details, see the hose reel section of this specification.</p>		
CC.	<p><b><u>VEHICLE PROTECTION LINE</u></b></p> <p>1) One (1) locally controlled 1.50-inch discharge valve and 90-degree swivel with male NH threads shall be provided at the</p>		

	rear of the apparatus adjacent to the plumbing area, passenger side. A hose tray with a minimum capacity of 50 feet of 1.50-inch hose shall be included adjacent to the end of the swivel. This shall serve as a pre-connected engine protection line. This option does not include hose.		
DD.	<p><b><u>FRONT ROAD SPRAYS</u></b></p> <p>1) A front ground sweep system shall be provided below the front bumper. The ground sweep system shall have a 1.50-inch main valve near the operator's panel. Two (2) Quick FloodJet nozzles shall be supplied below the front bumper. The nozzles will have electrically actuated Skinner valves independently controlled from the cab and labeled "LT GND SWP" and "RT GND SWP".</p>		
EE.	<p><b><u>HOSE REEL</u></b></p> <p>1) The apparatus shall be equipped with one (1) center mounted Hannay Reels polished aluminum super booster hose reel, or similar. The hose reel shall be mounted in the center between the top of the front driver's side compartment and the front passengers side compartment, top of the tank. The hose reel shall be equipped with the following features:</p> <ul style="list-style-type: none"> <li>a. Model number SBEPF-28-23-24</li> <li>b. Hose reel frame and drum shall be fabricated of polished aluminum, with a sprocket being chrome plated to minimize maintenance</li> <li>c. The inlet connection shall be 1.00-inch</li> <li>d. The outlet connection shall be 1.00-inch NPSH thread, Hannay part # 99.0102460</li> <li>e. Open stainless-steel rollers with aluminum brackets, steel bushings, mounted low to the driver side of the reel. The side rollers shall be approximately the width of the reel drum to allow full use of the drum to roll hose onto</li> <li>f. Hose capacity of a minimum of 150 feet of 1.00-inch hard line</li> <li>g. A manual rewind port with removable handle, mounted vertically</li> <li>h. An adjustable brake</li> <li>i. One 2/3 horsepower electric motor</li> </ul> <p>2) The hose reel shall be controlled by a locally controlled valve at the rear of the apparatus. The connection between the valve and the reel shall be with high pressure 1.00-inch flexible hose. The reel shall have two (2) rewind switches installed, one (1) on each side of the apparatus body, in a location to allow a fire fighter to hold the booster hose while pushing the rewind button. These switches shall be marine style sealed momentary switches with a chrome button protector ring to aide in the prevention of accidental impact. A third switch shall be installed at the hose reel next to the 70-amp breaker. The switch shall be a momentary switch that is sealed from the environment. Additionally, there shall be a separate momentary switch on the floor mounted center console for the driver to control the rewind of the reel while the</p>		

	apparatus is in pump-and-roll operations.		
FF.	<p><b><u>BOOSTER HOSE</u></b></p> <p>1) Two hundred feet (200) of 3/4-inch Mercedes Textiles Boostlite, or similar, booster hose shall be supplied and installed on the specified booster reel. Each section of hose shall be fifty (50) long and shall have 1.00-inch NPSH threaded aluminum pin hole couplings.</p>		
GG.	<p><b><u>NOZZLE CUPS/ HOSE CLAMPS</u></b></p> <p>1) Two (2) Ziamatic Corporation durable neoprene rubber cups shall be mounted on the driver side and passenger side front bulkhead, one (1) per side. Two (2) hose clamps shall be installed above each of the rubber cups to aid in securing the nozzle, one (1) per side. The components shall be installed on a piece of aluminum Unistrut to allow the end user to adjust the cup or clamp height.</p>		
HH.	<p><b><u>FOAM SYSTEM</u></b></p> <p>1) The pump system shall be provided with a Foam Pro model 1601 foam injection system, plumbed to the specified discharges. This product shall be an automatic foam proportioning system, with electronically controlled, direct concentrate injection occurring on the discharge, or pressure, side of the water pump. The system shall reliably and accurately meter Class A fire suppressant foam concentrates. These foam concentrates are typically proportioned at ratios of 0.2% - 0.5% of foam concentrate in solution. The proportional injection system shall ensure that only the specified amount of foam concentrate is used. The system shall be simple to operate and shall have a maximum pressure loss of 7 psi at 200 gpm. A microprocessor control device shall be provided which incorporates a closed-loop feedback signal for more accurate proportioning in variable flow conditions. A means shall be provided to prevent foam solution from returning to the pump, suction water source or engine water tank.</p> <p>2) The proportioner shall maintain accurate foam concentrate proportioning and injection rates over water discharge flows of 5 to 200 GPM and shall maintain accurate proportioning and injection rates throughout a range of 0 to 400 PSI. The proportioner shall be provided with a Foam Pro model 2660-0017 2-inch flowmeter. It shall be installed using 2-inch Victaulic couplings. The system shall provide flexibility in operation by maintaining a constant concentration of foam solution over a variable range of water stream flow rates and pressures. The proportioning rate shall be adjustable from 0.1% to 1.0% of the corresponding water discharge flow within the accuracy parameters recommended by NFPA.</p> <p>3) The system shall be compatible with nozzle aspirating systems, where nozzle flow volumes must be adjustable on demand, while maintaining a constant quality foam solution.</p> <p>4) Foam concentrate shall be provided from the onboard foam</p>		

	concentrate storage tank. 5) The foam system shall retain the manufacturer's black plastic housing and BFX Fire Apparatus shall install a smooth aluminum cover over the unit.		
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**SECTION M- NFPA 1906 ELECTRICAL SYSTEM TESTING**

A.	1) The fire apparatus low voltage electrical system shall be tested as required by this section and the test results shall be certified by the apparatus manufacturer. The certification shall be delivered to the Government with the documentation for the completed apparatus. The tests shall be performed when the air temperature is between 0°F and 110°F (18°C and 43°C).		
B.	<b><u>TEST SEQUENCE</u></b> 1) The three (3) tests defined below shall be performed in the order in which they appear. Before each test, the chassis batteries shall be fully charged until the voltage stabilizes at the voltage regulator set point and the lowest charge current is maintained for 10 minutes. The failure of any of these tests shall require a repeat of the test sequence.		
C.	<b><u>RESERVE CAPACITY TEST</u></b> 1) The chassis engine shall be started and kept running until the chassis engine and engine compartment temperatures are stabilized at normal operating temperatures and the chassis battery system is fully charged. The chassis engine shall be shut off and the minimum continuous electrical load shall be applied for 10 minutes. All electrical loads shall be turned off prior to attempting to restart the chassis engine. The chassis battery system shall then be capable of restarting the chassis engine. The failure to restart the chassis engine shall be considered a failure of this test.		
D.	<b><u>ALTERNATOR PERFORMANCE TEST AT IDLE</u></b> 1) The minimum continuous electrical load shall be applied with the chassis engine running at idle speed. The chassis engine temperature shall be stabilized at normal operating temperature. The chassis battery system shall be tested to detect the presence of a chassis battery current discharge. The detection of chassis battery current discharge shall be considered a failure of this test.		
E.	<b><u>ALTERNATOR PERFORMANCE TEST AT FULL LOAD</u></b> 1) The total continuous electrical load shall be applied with the chassis engine running up to the engine manufacturer's governed speed. The test duration shall be a minimum of two (2) hours. The activation of the electrical system load management system shall be permitted during this test. The activation of an alarm due to excessive chassis battery discharge, as detected by the system required by NFPA (current edition), or an electrical system voltage of less than 11.8 VDC for a 12 VDC nominal system, for more than 120 seconds, shall be considered a failure of this test.		

F.	<p><b><u>LOW VOLTAGE ALARM TEST</u></b></p> <p>1) Following the completion of the tests described above, the chassis engine shall be turned off. With the chassis engine turned off, the total continuous electrical load shall be applied and shall continue to be applied until the excessive battery discharge alarm activates. The chassis battery voltage shall be measured at the battery terminals.</p> <p>2) The test shall be a failure if the low voltage alarm has not yet sounded 140 seconds after the voltage drops to 11.70VDC for a 12 VDC nominal system. The chassis battery system shall then be able to restart the chassis engine. The failure of the chassis battery system to restart the chassis engine shall be considered a failure of this test.</p>		
G.	<p><b><u>DOCUMENTATION</u></b></p> <p>1) The apparatus manufacturer shall provide the results of the low-voltage electrical system performance test, certified in writing, with the documentation provided to the Government at the time of delivery of the completed apparatus.</p> <p>2) The test results shall consist of the following documents:</p> <p>3) Documentation of the electrical system performance tests.</p> <p>4) A written electrical load analysis, including the following:</p> <ul style="list-style-type: none"> <li>a. The nameplate rating of the alternator.</li> <li>b. The alternator rating under the conditions specified in NFPA 1906 (current edition).</li> <li>c. Each of the component loads specified that make up the minimum continuous electrical load.</li> <li>d. Additional electrical loads that, when added to the minimum continuous electrical load, determine the total continuous electrical load.</li> <li>e. Each individual intermittent electrical load.</li> </ul>		

**SECTION N- APPARATUS FINISH**

A.	<p><b><u>APPARATUS BODY COLOR</u></b></p> <p>1) The color of the apparatus body shall match the color of the chassis cab exterior. The chassis cab shall not be repainted.</p>		
B.	<p><b><u>APPARATUS BODY FINISH</u></b></p> <p>1) The exterior finish of the apparatus body shall gel coated to match the chassis cab. All aluminum and stainless steel shall remain unpainted. Any unpainted steel used in the fabrication of the mounting system shall be prepared for painting following the paint manufacturers recommendations for the preparation of the surface. Paint for all steel parts shall be gloss black acrylic automotive grade enamel.</p>		

C.	<p><b><u>GRAPHICS</u></b>  1) The color of the chassis cab exterior and body shall be <b>Oxford White (Z1)</b>.</p>		
D.	<p><b><u>STRIPING</u></b>  1) The apparatus shall be striped in accordance to Frederick-Firestone Fire Protection District's striping standards. A proposed rendering shall be provided to the department prior to the graphics being applied for their approval and/or comments.</p>		
E.	<p><b><u>REAR</u></b>  1) At least 4.00-inches, not to exceed 8.00-inches, of chevron striping, red and fluorescent yellow in color, shall be provided on the vertical rear facing surface of the apparatus body including the rear faces of the rear bumper shall be included. The pattern shall slope downward and away from the centerline of the vehicle at an angle of 45-degrees. If a single 4.00-inch wide vertical surface is unavailable, multiple strips may be used. Chevron striping shall cover as much of rear surface as practical, not including the top boxes, chainsaw, or spare tire doors, etc.</p>		