



SEDGWICK COUNTY, KANSAS
FINANCE DEPARTMENT
DIVISION OF PURCHASING
525 N. Main, Suite 823 ~ Wichita, KS 67203
Phone: 316 660-7255 Fax: 316-383-7055
<http://www.sedgwickcounty.org/finance/purchasing.asp>

REQUEST FOR PROPOSAL
#18-0028
PUMPER TRUCK

March 15, 2017

Sedgwick County, Kansas (hereinafter referred to as “county”) is seeking a firm or firms to provide one (1) Pumper truck for Sedgwick County Fire District #1. If your firm is interested in submitting a response, please do so in accordance with the instructions contained within the attached Request for Proposal. Responses are due no later than **1:45pm CST, Tuesday April 3, 2018.**

All contact concerning this solicitation shall be made through the Division of Purchasing. Proposers shall not contact county employees, department heads, using agencies, evaluation committee members or elected officials with questions or any other concerns about the solicitation. Questions, clarifications and concerns shall be submitted to the Division of Purchasing in writing. Failure to comply with these guidelines may disqualify the Proposer’s response.

Sincerely,

Britt Rosencutter
Buyer

BR/fy

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I. [About this Document](#)

This document is a Request for Proposal. It differs from a Request for Bid or Quotation in that the county is seeking a solution, as described on the cover page and in the following Background Information section, not a bid or quotation meeting firm specifications for the lowest price. As such, the lowest price proposed will not guarantee an award recommendation. As defined in Charter Resolution No. 68, Competitive Sealed Proposals will be evaluated based upon criteria formulated around the most important features of the product(s) and/or service(s), of which quality, testing, references, service, availability or capability, may be overriding factors, and price may not be determinative in the issuance of a contract or award. The proposal evaluation criteria should be viewed as standards that measure how well a vendor's approach meets the desired requirements and needs of the County. Criteria that will be used and considered in evaluation for award are set forth in this document. The county will thoroughly review all proposals received. The county will also utilize its best judgment when determining whether to schedule a pre-proposal conference, before proposals are accepted, or meetings with vendors, after receipt of all proposals. A Purchase Order/Contract will be awarded to a qualified vendor submitting the best proposal. **Sedgwick County reserves the right to select, and subsequently recommend for award, the proposed service(s) and/or product(s) which best meets its required needs, quality levels and budget constraints.**

The nature of this work is for a public entity and will require the expenditure of public funds and/or use of public facilities, therefore the successful proposer will understand that portions (potentially all) of their proposal may become public record at any time after receipt of proposals. Proposal responses, purchase orders and final contracts are subject to public disclosure after award. All confidential or proprietary information should be clearly denoted in proposal responses

and responders should understand this information will be considered prior to release, however no guarantee is made that information will be withheld from public view.

II. Background

Sedgwick County, located in south-central Kansas, is one of the most populous of Kansas' 105 counties with a population estimated at more than 514,000 persons. It is the sixteenth largest in area, with 1,008 square miles, and reportedly has the second highest per capita wealth among Kansas' counties. Organizationally, the county is a Commission/Manager entity, employs nearly 2,500 persons, and hosts or provides a full range of municipal services, e.g. – public safety, public works, criminal justice, recreation, entertainment, cultural, human/social, and education.

III. Project Objectives

Sedgwick County, Kansas (hereinafter referred to as “county”) is seeking a firm or firms to provide (1) Pumper truck for Sedgwick County Fire District #1 in accordance with the specifications outlined.

IV. Submittals

Carefully review this Request for Proposal. It provides specific technical information necessary to aid participating firms in formulating a thorough response. Should you elect to participate, submit one (1) original **AND** one (1) electronic copy (.PDF/Word supplied on a flash drive) of the entire document with any supplementary materials to:

Britt Rosencutter
Sedgwick County Division of Purchasing
525 N. Main, Suite 823
Wichita, KS 67203

SUBMITTALS are due **NO LATER THAN 1:45 p.m. CDT, TUESDAY, April 3, 2018**. Responses must be sealed and marked on the lower left-hand corner with the firm name and address, proposal number, and proposal due date. Late or incomplete responses will not be accepted and will not receive consideration for final award.

Proposal responses will be acknowledged and read into record at bid opening which will occur at 2:00 p.m. CDT, on the due date. No information other than the respondent's name will be disclosed at proposal opening.

V. Scope of Work

Proposals taking total exception to specifications shall not be acceptable. Proposers shall submit a detailed proposal. A letter only, even though written on a company letterhead, shall not be sufficient. Proposals shall be submitted in the same sequence as specifications for ease of evaluation, comparison and checking of compliance. Any exception to these requirements shall not be tolerated and may result in disqualification of proposal response.

This document has several headings, which are in bold type and underlined. The headings should be considered a question on how the manufacturer will complete the item or how the manufacturer meets or intends to meet the qualifications set forth.

- A. Sedgwick County Fire District #1 will require certain items to be used in the manufacturing of this apparatus. Under certain headings this equipment or method of construction will be noted as a specification. These specifications point out the desired qualifications on this apparatus. Any exceptions from the desired qualifications will require an in-depth explanation of the manufacturer's intent and purpose.
- B. Any other items or options that the manufacturer deems necessary, relevant or advantageous to this apparatus can be submitted with the proposal. These items should be listed with the price of the proposed item on a separate page(s) under the header “Additional Provisions.” The County reserves the right to select one (1), some or none of the options identified.

It shall be the intent of this request for proposal(s) to outline the general intent of favorable provisions for the furnishing and delivery of a complete fire apparatus. These detailed specifications cover the preferred minimum requirements as to the type of construction and test to which the apparatus shall conform, together with certain details as to finish, equipment and appliances with which the successful proposer shall conform. Minor details of construction and materials, which are not otherwise specified, are left to the discretion of the contractor. The manufacturer shall provide loose equipment only when specified by the County. Otherwise, in accordance with the current edition of NFPA 1901 standards, the proposal shall specify whether the fire department or apparatus dealership shall provide required loose equipment.

In order to ensure fair, ethical and legal competition, neither original equipment manufacturer (OEM) or parent company of the OEM shall have ever been fined or convicted of price fixing, bid rigging, or collusion in any domestic or international fire apparatus market (no exception).

Proposals shall only be considered from companies that have an established reputation in the field of fire apparatus construction and have been in business for a minimum of 20 years. Further, proposer shall maintain dedicated service facilities for the repair and service of products. Evidence of such a facility shall be included in the proposal.

Each proposer shall furnish satisfactory evidence of their ability to construct the apparatus specified and shall state the state and location of the factory where the apparatus is to be built. The proposer shall also show that the company is in position to render prompt service and to furnish replacement parts.

Each proposal shall be accompanied by a detailed set of Contractor's Specifications consisting of a detailed description of the apparatus and equipment proposed, and to which the apparatus furnished under contract shall conform. These specifications shall indicate size, type, model and make of all component parts and equipment.

Proposers shall also indicate in the "Yes/No" column if their proposal complies on each item (paragraph) specified. Exceptions shall be allowed if they are equal to or superior to that specified and provided they are listed and fully explained on a separate page.

All exceptions shall be stated no matter how seemingly minor. Any exceptions not taken shall be assumed by the purchaser to be included in the proposal, regardless of the cost to the proposer.

Description	Bidder Complies	
	Yes	No
<p><u>SPECIFICATIONS FOR A PUMPER TRUCK</u></p> <p><u>INTENT OF SPECIFICATIONS</u></p> <p>It shall be the intent of these specifications to cover the furnishing and delivery of a complete fire apparatus. These detailed specifications cover the requirements as to the type of construction and test to which the apparatus shall conform, together with certain details as to finish, equipment and appliances with which the successful bidder shall conform. Minor details of construction and materials, which are not otherwise specified, are left to the discretion of the contractor. The manufacturer shall provide loose equipment only when specified by the customer. Otherwise, in accordance with the current edition of NFPA 1901 standards, the proposal shall specify whether the fire department or apparatus dealership shall provide required loose equipment.</p> <p>In order to ensure fair, ethical, and legal competition, neither original equipment manufacturer (O.E.M.) or parent company of the O.E.M. shall have ever been fined or convicted of price fixing, bid rigging, or collusion in any domestic or international fire apparatus market (no exception).</p> <p>Proposals shall only be considered from companies that have an established reputation in the field of fire apparatus construction and have been in business for a minimum of 20 years. Further, proposer shall maintain dedicated service facilities for the repair and service of products. Evidence of such a facility shall be included in the proposal.</p>		

	<p>Each proposer shall furnish satisfactory evidence of their ability to construct the apparatus specified and shall state the location of the factory where the apparatus is to be built. The proposer shall also show that the company is in position to render prompt service and to furnish replacement parts.</p> <p>Each proposal shall be accompanied by a detailed set of Contractor's Specifications consisting of a detailed description of the apparatus and equipment proposed, and to which the apparatus furnished under contract shall conform. These specifications shall indicate size, type, model and make of all component parts and equipment.</p> <p>Images and illustrative material in this specification are as accurate as known at the time of publication, but are subject to change without notice. Images and illustrative material is for reference only, and may include optional equipment and accessories and may not include all standard equipment.</p>		
1.	<p><u>QUALITY AND WORKMANSHIP</u></p> <p>The design of the apparatus shall embody the latest approved automotive engineering practices. The workmanship shall be of the highest quality in its respective field. Special consideration shall be given to the following points: Accessibility of the various units which require periodic maintenance; ease of operation (including both pumping and driving); and symmetrical proportions. Construction shall be rugged and ample safety factors shall be provided to carry the loads specified and to meet both on and off road requirements and speed conditions as set forth under Performance Tests and Requirements. Welding shall not be employed in the assembly of the apparatus in a manner that shall prevent the ready removal of any component part for service or repair. All steel welding shall follow American Welding Society D1.1-2004 recommendations for structural steel welding. All aluminum welding shall follow American Welding Society and ANSI D1.2-2003 requirements for structural welding of aluminum. All sheet metal welding shall follow American Welding Society B2.1-2000 requirements for structural welding of sheet metal. Flux core arc welding to use alloy rods, type 7000, American Welding Society standards A5.20-E70T1. Employees classified as welders are tested and certified to meet American Welding Society codes upon hire and every three (3) years thereafter. The manufacturer shall be required to have an American Welding Society certified welding inspector in plant during working hours to monitor weld quality.</p>		
2.	<p><u>DELIVERY</u></p> <p>Apparatus, to insure proper break in of all components while still under warranty, shall be delivered under its own power - rail or truck freight shall not be acceptable. A qualified delivery engineer representing the contractor shall deliver the apparatus and remain for a sufficient length of time to instruct personnel in the proper operation, care and maintenance of the equipment delivered.</p>		
3.	<p><u>INFORMATION REQUIRED</u></p> <p>The manufacturer shall supply at time of delivery, complete operation and maintenance manuals covering the completed apparatus as delivered. A permanent plate shall be mounted in the driver's compartment which specifies the quantity and type of fluids required including engine oil, engine coolant, transmission, pump transmission lubrication, pump primer and drive axle.</p>		

4.	<u>PERFORMANCE TESTS AND REQUIREMENTS</u> 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 driving conditions, during which time the apparatus shall show no loss of power or overheating. The transmission drive shaft or shafts, and rear axles shall run quietly and be free from abnormal vibration or noise throughout the operating range of the apparatus. Vehicle shall adhere to the following parameters:		
A	The apparatus, when fully equipped and loaded, shall have not less than 25 percent nor more than 50 percent of the weight on the front axle, and not less than 50 percent nor more than 75 percent on the rear axle. The apparatus shall be designed with due consideration to distribution of load between the front and rear axles. Weight balance and distribution shall be in accordance with the recommendations of the National Fire Protection Association.		
B	The apparatus shall be capable of accelerating to 35 mph from a standing start within 25 seconds on a level concrete highway without exceeding the maximum governed rpm of the engine.		
C	The service brakes shall be capable of stopping a fully loaded vehicle in 35 feet at 20 mph on a level concrete highway. The air brake system shall conform to Federal Motor Vehicle Safety Standards (FMVSS) 121.		
D	The apparatus, fully loaded, shall be capable of obtaining a speed of 50 mph on a level concrete highway with the engine not exceeding its governed rpm (full load).		
5.	<u>FAILURE TO MEET TEST</u> In the event the apparatus fails to meet the test requirements of these specifications on the first trial, second trials may be made at the option of the proposer within 30 days of the date of the first trial. 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 proposer 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.		
6.	<u>LIABILITY</u> The successful proposer shall defend any and all suits and assume all liability for the use of any patented process including any device or article forming a part of the apparatus or any appliance furnished under the contract.		
7.	<u>EXCEPTIONS</u> All exceptions shall be stated no matter how seemingly minor. Any exceptions not taken shall be assumed by the purchaser to be included in the proposal, regardless of the cost to the bidder.		
8.	<u>NFPA 2016 STANDARDS</u> This apparatus specification includes a commercial chassis that has not been certified to meet the requirements of NFPA 1901 by the chassis manufacturer. Although this chassis may comply with certain aspects of the standard, has not received certification from this chassis manufacturer that all criteria have been met. The body as built by the manufacturer must comply with the NFPA standards effective January of 2016.		
A			
B	Certification of slip resistance of all stepping, standing and walking surfaces must be supplied with delivery of the apparatus.		

C	All horizontal surfaces designated as a standing or walking surface that are greater than 48.00" above the ground must be defined by a 1.00" wide line along its outside perimeter. Perimeter markings and designated access paths to destination points shall be identified on the customer approval print and are shown as approximate. Actual location(s) shall be determined based on materials used and actual conditions at final build. Access paths may pass through hose storage areas and opening or removal of covers or restraints may be required. Access paths may require the operation of devices and equipment such as the aerial device or ladder rack.		
D	A plate that is highly visible to the driver while seated shall be provided. This plate shall show the overall height, length, and gross vehicle weight rating.		
E	The manufacturer shall have programs in place for training, proficiency testing and performance for any staff involved with certifications.		
F	An official of the company shall designate, in writing, who is qualified to witness and certify test results.		
9.	<u>NFPA COMPLIANCE</u>		
	Apparatus proposed by the bidder shall meet the applicable requirements of the National Fire Protection Association (NFPA) as stated in the current edition at time of contract execution. Fire Department's specifications that differ from NFPA specifications shall be indicated in the proposal as "non-NFPA."		
10.	<u>PUMP TEST</u> The rated water pump shall be tested, approved, and certified by an ISO certified independent third party testing agency at the manufacturer's expense. The test results, along with the pump manufacturer's certification of hydrostatic test, the engine manufacturer's certified brake horsepower curve, and the manufacturer's record of pump construction details shall be forwarded to the Fire Department.		
11.	<u>GENERATOR TEST</u>		
	If the unit has a generator, the generator shall be tested, approved, and certified by an ISO certified independent third party testing agency at the manufacturer's expense. The test results shall be provided to the Fire District at the time of delivery.		
12.	<u>TRAINING</u> Training from a factory certified trainer will be provided on each unit for a maximum of 24 hours (three 8 hour shifts). There will also be a factory trainer on aerial devices. This training can take place on the consecutive days you choose.		
13.	<u>SERVICE</u> The proposer has service centers within Kansas or has mobile service within 6 hours normal driving time to the department location. These services will be covering the state of Kansas. You will provide phone numbers, contact persons and an emergency 24/7 number for the dealership. You can also contact your sales person in emergencies.		
A			
B	Provide the County with a 24/7 phone number to customer service from the factory level as well.		
14.	<u>WEEKLY PHOTO REPORTS</u> There will be provided with this order a weekly construction photo report via e-mail of the unit(s). This will be a detailed report showing all aspects of the build of the unit(s).		

15.	<p><u>BID BOND</u> All bidders shall provide a bid bond as security for the bid in the form of a 10% bid bond to accompany their bid. This bid bond shall be issued by a Surety Company who is listed on the U.S. Treasury Departments list of acceptable sureties as published in Department Circular 570. The bid bond shall be issued by an authorized representative of the Surety Company and shall be accompanied by a certified power of attorney dated on or before the date of bid. The bid bond shall include language, which assures that the bidder/principal shall give a bond or bonds as may be specified in the bidding or contract documents, with good and sufficient surety for the faithful performance of the contract, including the Basic One (1) Year Limited Warranty, and for the prompt payment of labor and material furnished in the prosecution of the contract.</p>		
A	<p>Notwithstanding any document or assertion to the contrary, any surety bond related to the sale of a vehicle shall apply only to the Basic One (1) Year Limited Warranty for such vehicle. Any surety bond related to the sale of a vehicle shall not apply to any other warranties that are included within this bid (OEM or otherwise) or to the warranties (if any) of any third party of any part, component, attachment or accessory that is incorporated into or attached to the vehicle. In the event of any contradiction or inconsistency between this provision and any other document or assertion, this provision shall prevail.</p>		
16.	<p><u>APPROVAL DRAWING</u> A drawing of the proposed apparatus shall be provided for approval before construction begins. The sales representative shall also have a copy of the same drawing. The finalized and approved drawing shall become part of the contract documents. This drawing shall indicate the chassis make and model, location of the lights, siren, horns, compartments, major components, etc.</p>		
A	<p>A "revised" approval drawing of the apparatus shall be prepared and submitted by the manufacturer to the purchaser showing any changes made to the approval drawing.</p>		
17.	<p><u>ELECTRICAL WIRING DIAGRAMS</u> Two (2) electrical wiring diagrams, prepared for the body as it interfaces with the commercial chassis, shall be provided.</p>		
18.	<p><u>CHASSIS</u> The chassis shall be a Gladiator model or equivalent. 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>		
A.	<p>The chassis shall have a vehicle identification number that reflects a 2018 model year.</p>		
B.	<p>The chassis shall be put in service in the country of United States of America (USA).</p>		
C.	<p>The chassis will meet applicable U.S.A. federal motor vehicle safety standards per CFR Title 49 Chapter V Part 571 as clarified in the incomplete vehicle book per CFR Title 49 Chapter V Part 568 Section 4 which accompanies each chassis.</p>		

19.	<u>CAB AND CHASSIS LABELING LANGUAGE</u>		
	The cab and chassis shall include the applicable caution, warning, and safety notice labels with text to be written in English.		
20.	<u>APPARATUS TYPE</u>		
	The apparatus shall be a pumper vehicle designed for emergency service use which shall be equipped with a permanently mounted fire pump which has a minimum rated capacity of 750 gallons per minute (3000 L/min). The apparatus shall include a water tank and hose body whose primary purpose is to combat structural and associated fires.		
21.	<u>VEHICLE TYPE</u>		
	The chassis shall be manufactured for use as a straight truck type vehicle and designed for the installation of a permanently mounted apparatus behind the cab. The apparatus of the vehicle shall be supplied and installed by the apparatus manufacturer.		
22.	<u>AXLE CONFIGURATION</u>		
	The chassis shall feature a 4 x 2 axle configuration consisting of a single rear drive axle with a single front steer axle.		
23.	<u>GROSS AXLE WEIGHT RATINGS FRONT</u>		
	The front gross axle weight rating (GAWR) of the chassis shall be 21,500 pounds. This front gross axle weight rating shall be adequate to carry the weight of the completed apparatus including all equipment and personnel.		
24.	<u>GROSS AXLE WEIGHT RATINGS REAR</u>		
	The rear gross axle weight rating (GAWR) of the chassis shall be 27,000 pounds. This rear gross axle weight rating shall be adequate to carry the weight of the completed apparatus including all equipment and personnel.		
25.	<u>PUMP PROVISION</u>		
	The chassis shall include provisions to mount a drive line pump in the middle of the chassis, behind the cab, more commonly known as the mid-ship location. Chassis driveline pump provisions shall include an interlock feature for automatic setting of the park brake when the vehicle is shifted out of road mode while the transmission is in neutral. When the conditions are met the driver side parking brake valve shall activate. Once shifted to road mode the condition for electric automatic brake engagement is no longer present and the driver's parking brake control valve shall function normally.		
26.	<u>WATER & FOAM TANK CAPACITY</u>		
	The chassis shall include a carrying capacity of 750 gallons (2839 liters) to 1250 gallons (4732 liters). The water and/or foam tank(s) shall be supplied and installed by the apparatus manufacturer.		
27.	<u>CAB STRUCTURAL WARRANTY</u>		
	Summary of Warranty Terms: The cab structure shall be warranted for a period of ten (10) years or one hundred thousand (100,000) miles which ever may occur first. The warranty period shall commence on the date the vehicle is delivered to the first end user.		

28.	<u>CAB TEST INFORMATION</u>		
A	The cab shall have successfully completed the preload side impact, static roof load application and frontal impact without encroachment to the occupant survival space when tested in accordance with Section 4 of SAE J2420 <u>COE Frontal Strength Evaluation Dynamic Loading Heavy Trucks</u> , Section 5 of SAE J2422 <u>Cab Roof Strength Evaluation Quasi –Static Loading Heavy Trucks</u> and ECE R29 <u>Uniform Provisions Concerning the Approval of Vehicles with regard to the Protection of the Occupants of the Cab of a Commercial Vehicles Annex 3 Paragraph 5.</u>		
B	The above tests have been witnessed by and attested to by an independent third party. The test results were recorded using cameras, high speed imagers, accelerometers and strain gauges. Documentation of the testing shall be provided upon request.		
29.	<u>CAB STYLE</u> The cab shall be a custom, fully enclosed, MFD model with a 10.00 inch raised roof over the driver, officer, and crew area, designed and built specifically for use as an emergency response vehicle by a company specializing in cab and chassis design for all emergency response applications. The cab shall be designed for heavy-duty service utilizing superior strength and capacity for the application of protecting the occupants of the vehicle. This style of cab shall offer up to eight (8) seating positions.		
A	The cab shall incorporate a fully enclosed design with side wall roof supports, allowing for a spacious cab area with no partition between the front and rear sections of the cab. To provide a superior finish by reducing welds that fatigue cab metal; the roof, the rear wall and side wall panels shall be assembled using a combination of welds and proven industrial adhesives designed specifically for aluminum fabrication for construction.		
B	The cab shall be constructed using multiple aluminum extrusions in conjunction with aluminum plate, which shall provide proven strength and the truest, flattest body surfaces ensuring less expensive paint repairs if needed. All aluminum welding shall be completed to the American Welding Society and ANSI D1.2-96 requirements for structural welding of aluminum.		
C	All interior and exterior seams shall be sealed for optimum noise reduction and to provide the most favorable efficiency for heating and cooling retention.		
D	The cab shall be constructed of 5052-H32 corrosion resistant aluminum plate. The cab shall incorporate tongue and groove fitted 6061-T6 0.13 & 0.19 inch thick aluminum extrusions for extreme duty situations. A single formed, one (1) piece extrusion shall be used for the “A” pillar, adding strength and rigidity to the cab as well as additional roll-over protection. The cab side walls and lower roof skin shall be 0.13 inch thick; the rear wall and raised roof skins shall be 0.09 inch thick; the front cab structure shall be 0.19 inch thick.		
E	The exterior width of the cab shall be 99.40 inches wide with a minimum interior width of 91.00 inches. The overall cab length shall be 131.10 inches with 54.00 inches from the centerline of the front of the axle to the back of the cab.		
F	The cab interior shall be designed to afford the maximum usable interior space and attention to ergonomics with hip and legroom while seated which exceeds industry standards. The crew cab floor shall be flat across the entire walking area for ease of movement inside the cab.		
G	The cab shall offer an interior height of 57.50 inches from the front floor to the headliner in the non-raised roof area and a rear floor to headliner height of 65.00 inches in the raised roof area, at a minimum. The cab shall offer an interior measurement at the floor level from the rear of the engine tunnel to the rear wall of the cab of 49.88 inches. All interior measurements shall include the area within the interior trimmed surfaces and not to any unfinished surface.		

E	The cab shall include a driver and officer area with two (2) cab doors large enough for personnel in full firefighting gear. The front doors shall offer a clear opening of 40.25 inches wide X 53.50 inches high, from the cab floor to the top of the door opening. The cab shall also include a crew area with up to two (2) cab doors, also large enough for personnel in full firefighting gear. The rear doors shall offer a clear opening of 32.25 inches wide X 61.00 inches high, from the cab floor to the top of the door opening.		
F	The cab shall incorporate a progressive two (2) step configuration from the ground to the cab floor at each door opening. The progressive steps are vertically staggered and extend the full width of each step well allowing personnel in full firefighting gear to enter and exit the cab easily and safely.		
G	The first step for the driver and officer area shall measure approximately 11.50 inches deep X 31.13 inches wide. The intermediate step shall measure approximately 8.50 inches deep X 32.50 inches wide. The height from the first step to the intermediate step and the intermediate step to the cab floor shall not exceed 11.00 inches.		
H	The first step for the crew area shall measure approximately 11.50 inches deep X 20.44 inches wide. The intermediate step shall measure approximately 10.25 inches deep X 22.75 inches wide. The height from the first step to the intermediate step and the intermediate step to the cab floor shall not exceed 12.80 inches.		
30.	<u>OCCUPANT PROTECTION</u>		
A	The vehicle shall include the Advanced Protection System™ (APS) which shall secure belted occupants and increase the survivable space within the cab. The APS shall selectively deploy integrated systems to protect against injuries in qualifying frontal impact, side impact, and rollover events. The increase in survivable space and security of the APS shall also provide ejection mitigation protection. The system components shall include:		
	<ul style="list-style-type: none"> • Driver steering wheel airbag 		
	<ul style="list-style-type: none"> • Driver dual knee air bags (patent pending) with energy management mounting (patent pending) and officer knee airbag. 		
	<ul style="list-style-type: none"> • Large driver, officer, and crew area side curtain airbags. 		
	<ul style="list-style-type: none"> • APS advanced seat belt system - retractor pre-tensioners tighten the seat belts around the occupants, securing the occupants in seats and load limiters play out some of the seat belt webbing to reduce seat belt to chest and torso force upon impact as well as mitigate head and neck injuries. 		
	<ul style="list-style-type: none"> • Heavy truck Restraints Control Module (RCM) - receives inputs from the outboard sensors, selectively deploys APS systems, and records sensory inputs immediately before and during a detected qualifying event. 		
	<ul style="list-style-type: none"> • Integrated outboard crash sensors mounted at the perimeter of the vehicle - detects a qualifying front or side impact event and monitors and communicates vehicle status and real time diagnostics of all critical subsystems to the RCM. 		
	<ul style="list-style-type: none"> • Fault-indicating Supplemental Restraint System (SRS) light on the driver's instrument panel. 		
B	Frontal impact protection shall be provided by the outboard sensors and the RCM. In a qualifying front impact event the outboard sensors provide inputs to the RCM. The RCM activates the steering wheel airbag, driver side dual knee airbags (patent pending), officer side knee airbag, and advanced seat belts for each occupant in the cab.		
C	Rollover, side impact, and ejection mitigation shall be provided by the outboard sensors and the RCM. In qualifying rollover or side impact events the outboard sensors provide inputs to the RCM. The RCM activates the side curtain airbags and advanced seat belts for each		

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	occupant in the cab. The RCM measures roll angle, lateral acceleration, and roll rate to determine if a rollover event or side impact event is imminent or occurring.		
D	In the event of a qualifying offset or other non-frontal impact, the RCM shall determine and intelligently deploy the front impact protection system, the side impact protection system, or both front and side impact protection systems based on the inputs received from the outboard crash sensors.		
31.	<u>ELECTRICAL SYSTEM</u>		
	The chassis shall include a single starting electrical system which shall include a 12 volt direct current multiplexing system, suppressed per SAE J551. The wiring shall be appropriate gauge cross link with 311 degree Fahrenheit insulation. All SAE wires in the chassis shall be color coded and shall include the circuit number and function where possible. The wiring shall be protected by 275 degree Fahrenheit minimum high temperature flame retardant loom. All nodes and sealed Deutsch connectors shall be waterproof.		
32.	<u>OEM WIRING</u>		
	The wiring system shall include a custom J1939 interface harness drop provided by the chassis manufacturer designed to meet the requirements provided by the OEM.		
A	The wiring system shall also include a prewire for ECM park brake input and engine ground return circuits located behind the switch panel. The circuits shall include an extra 2 feet of wire and shall be labeled "ECM Park Brake Input".		
33.	<u>APPARATUS WIRING PROVISION</u>		
	An apparatus wiring panel shall be installed in the center dash area behind the rocker switch panel which shall include eight (8) open circuits consisting of three (3) 20 amp, one (1) 30 amp, three (3) 10 amp, and one (1) 15 amp circuit, with relays and breakers with trigger wires which shall be routed to the rocker switch panel.		
34.	<u>MULTIPLEX DISPLAY</u>		
A	The multiplex electrical system shall include (2) Weldon Vista IV displays which shall be located one (1) on the right side of the dash in the switch panel and one (1) on the left side of the dash in the switch panel. The Vista IV displays shall feature full color LCD display screens which include a message bar displaying the time of day and important messages requiring acknowledgement by the user which shall all be displayed on the top of the screen in the order they are received. There shall be eight (8) push button virtual controls, four (4) on each side of the display for the on-board diagnostics. The display screens shall be video ready for back-up cameras, thermal cameras, and DVD.		
B	The Vista IV displays shall offer varying fonts and background colors. The displays shall be fully programmable to the needs of the customer and shall offer virtually infinite flexibility for screen configuration options.		
35.	<u>LOAD MANAGEMENT SYSTEM</u>		
	The apparatus load management shall be performed by the included multiplex system. The multiplex system shall also feature the priority of sequences and shall shed electrical loads based on the priority list specifically programmed.		

36. A	<p><u>DATA RECORDING SYSTEM</u></p> <p>The chassis shall have a Weldon Vehicle Data Recorder (VDR) system installed. The system shall be designed to meet NFPA 1901 and shall be integrated with the Weldon Multiplex electrical system. The following information shall be recorded:</p>		
	<ul style="list-style-type: none"> • Vehicle Speed 		
	<ul style="list-style-type: none"> • Acceleration 		
	<ul style="list-style-type: none"> • Deceleration 		
	<ul style="list-style-type: none"> • Engine Speed 		
	<ul style="list-style-type: none"> • Engine Throttle Position 		
	<ul style="list-style-type: none"> • ABS Event 		
	<ul style="list-style-type: none"> • Seat Occupied Status 		
	<ul style="list-style-type: none"> • Seat Belt Status 		
	<ul style="list-style-type: none"> • Master Optical Warning Device Switch Position 		
	<ul style="list-style-type: none"> • Time 		
	<ul style="list-style-type: none"> • Date 		
B	<p>Each portion of the data shall be recorded at the specified intervals and stored for the specified length of time to meet NFPA 1901 guidelines and shall be retrievable by connecting a laptop computer to the VDR system.</p>		
37.	<p><u>ACCESSORY POWER</u></p> <p>The electrical distribution panel shall include two (2) power studs. The studs shall be size #10 and each of the power studs shall be circuit protected with a fuse of the specified amperage. One (1) power stud shall be capable of carrying up to a 40 amp battery direct load. One (1) power stud shall be capable of carrying up to a 15 amp ignition switched load. The two (2) power studs shall share one (1) #10 ground stud. A 225 amp battery direct power and ground stud shall be provided and installed on the chassis near the left hand battery box for OEM body connections.</p>		
38.	<p><u>AUXILIARY ACCESSORY POWER</u></p> <p>An auxiliary ten (10) position blade type fuse panel shall be installed behind the officer's seat. The fuse panel shall be protected by a 40 amp fuse located at the batteries. The panel shall be capable of carrying up to a maximum 40 amp battery direct load.</p>		
39..	<p><u>EXTERIOR ELECTRICAL TERMINAL COATING</u></p>		
	<p>All terminals exposed to the elements will be sprayed with a high visibility protective rubberized coating to prevent corrosion.</p>		
40.	<p><u>CAB FRONT FASCIA</u></p>		
A	<p>The front cab fascia shall be constructed of 5052-H32 Marine Grade, 0.13 of an inch thick aluminum plate which shall be an integral part of the cab. The fascia shall be styled offering an aerodynamic look for a stylish appearance. The cab fascia shall encompass the front of the aluminum cab structure from the bottom of the windshield to the lower section of the cab.</p>		
B	<p>The cab fascia shall include provisions for headlights, turn signals and warning light assemblies designed to permit easy access for maintenance. The fascia shall include additional intake provisions at the lower portion just above the bumper further enhancing the total free air intake for engine cooling.</p>		
C	<p>Chrome plated molded plastic bezels shall be provided for lighting assemblies located on each side of the cab fascia for optimum visibility.</p>		

41.	<u>FRONT GRILLE</u>		
	The fascia shall include a two (2) piece front grille. The upper portion of the grille shall be hinged to provide service access behind the grille.		
42.	<u>CAB UNDERCOAT</u>		
	There shall be a rubberized undercoating applied to the underside of the cab that provides abrasion protection, sound deadening and corrosion protection.		
43.	<u>CAB SIDE DRIP RAIL</u>		
	There shall be a drip rail along the top radius of each cab side. The drip rails shall help prevent water from the cab roof running down the cab side.		
44.	<u>CAB PAINT EXTERIOR</u>		
A	The cab shall be painted prior to the installation of glass accessories and all other cab trim to ensure complete paint coverage and the maximum in corrosion protection of all metal surfaces.		
B	All metal surfaces on the entire cab shall be ground by disc to remove any surface oxidation or surface debris which may hinder the paint adhesion. Once the surface is machine ground a high quality acid etching of base primer shall be applied. Upon the application of body fillers and their preparation, the cab shall be primed with a coating designed for corrosion resistance and surface paint adhesion. The maximum thickness of the primer coat shall be 2.00 mils.		
C	The entire cab shall then be coated with an intermediate solid or epoxy surfacing agent that is designed to fill any minor surface defects, provide an adhesive bond between the primer and the paint and improve the color and gloss retention of the color. The finish to this procedure shall be a sanding of the cab with 360 grit paper followed by sealing the seams with seam sealer.		
D	The cab shall then be painted the specific color designated by the customer with an acrylic urethane type system designed to retain color and resist acid rain and most atmospheric chemicals found on the fire ground or emergency scene. The paint shall have a minimum thickness of 2.00 mils, followed by a clear top coat not to exceed 2.00 mils. The entire cab shall then be baked at 180 degrees for one (1) hour to speed the curing process of the coatings.		
45.	<u>CAB PAINT MANUFACTURER</u>		
	The cab shall be painted with PPG Industries paint.		
46.	<u>CAB PAINT PRIMARY/LOWER COLOR</u>		
	The lower paint color shall be PPG FBCH 71096 ALT Red.		
47.	<u>CAB PAINT SECONDARY/UPPER COLOR</u>		
	The secondary/upper paint color shall be PPG FBCH 8717 white.		
48.	<u>CAB PAINT EXTERIOR BREAKLINE</u>		
	The upper and lower paint shall meet at a breakline on the cab which shall be located approximately 0.50 inch below the cab door windows on each side of the cab. The breakline shall curve downward at the front cab corners to approximately 6.50 inches below the windshields on the front of the cab ending at either side of the upper grille.		
49.	<u>CAB PAINT PINSTRIPE</u>		
	Where the upper and lower paint colors meet a temporary 0.50 inch wide black pinstripe shall be applied over this break line to offer a more finished look prior to the final pinstripe being installed by the OEM.		
50.	<u>CAB PAINT WARRANTY</u>		

	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.		
51.	<u>CAB PAINT INTERIOR</u> The visible interior cab structure surfaces shall feature a medium gray Spar-Liner spray on bed liner coating which shall mold to each surface of the cab interior. The Spar-Liner shall be environmentally friendly and chemically resistant.		
52.	<u>CAB ENTRY DOORS</u>		
A	The cab shall include four (4) entry doors, two (2) front doors and two (2) crew doors designed for ease of entering and egress when outfitted with an SCBA. The doors shall be constructed of extruded aluminum with a nominal thickness of 0.13 inch. The exterior skins shall be constructed of 0.13 inch aluminum plate.		
B	The doors shall include a double rolled style automotive rubber seal around the perimeter of each door frame and door edge which ensures a weather tight fit.		
C	All door hinges shall be hidden within flush mounted cab doors for a pleasing smooth appearance and perfect fit along each side of the cab. Each door hinge shall be piano style with a 0.38 inch pin and shall be constructed of stainless steel.		
53.	<u>CAB ENTRY DOOR TYPE</u> All cab entry doors shall be full length in design to fully enclose the lower cab steps. Entry doors shall include Pollak mechanical plunger style switches for electrical component activation.		
54.	<u>CAB INSULATION</u> The cab ceiling and walls shall include 1.00 inch thick foam insulation. The insulation shall act as a barrier absorbing noise as well as assisting in sustaining the desired climate within the cab interior.		
55.	<u>LH MID EMS COMPARTMENT</u> The cab shall include a compartment located in the middle of the wall above the left side wheel well. This compartment shall measure 17.00 inches wide X 43.00 inches high X 23.00 inches deep.		
56.	<u>LH MID EMS COMPARTMENT INTERIOR</u> The cab compartment located in the middle of the wall above the left side wheel well shall include solid aluminum walls with an interior access point rear facing. This compartment shall be finished to customer specification.		
57.	<u>LH MID EMS INTERIOR ACCESS</u> The mid crew area cab left side EMS compartment shall be accessible from the inside of the cab through a ROM series IV roll up door. The compartment shall have a clear door opening of approximately 14.50 inches wide and as tall as possible in the available customer specified left EMS compartment height and access point.		
58.	<u>LH MID EMS COMPARTMENT INTERIOR SHELVING</u> The left hand mid EMS compartment located in crew area of the cab shall include one (1) aluminum shelf which shall be secured using Unistrut channel on two (2) sides of the interior walls of the compartment. The shelf shall include a 1.00 inch lip around the edges. The shelf shall be finished the same as the interior of the compartment.		
59.	<u>RH MID EMS COMPARTMENT</u> The cab shall include a compartment located in the middle of the wall above the right side wheel well. This compartment shall measure 17.00 inches wide X 43.00 inches high X 23.00 inches deep.		

60.	<u>RH MID EMS COMPARTMENT INTERIOR</u> The cab compartment located in the middle of the wall above the right side wheel well shall include solid aluminum walls with an interior access point rear facing. This compartment shall be finished to customer specification.		
61.	<u>RH MID EMS INTERIOR ACCESS</u> The mid crew area cab right side EMS compartment shall be accessible from the inside of the cab through a ROM series IV roll up door. The compartment shall have a clear door opening of approximately 14.50 inches wide and as tall as possible in the available customer specified right EMS compartment height and access point.		
62.	<u>RH MID EMS COMPARTMENT INTERIOR SHELVING</u> The right hand mid EMS compartment located in crew area of the cab shall include one (1) aluminum shelf which shall be secured using Unistrut channel on two (2) sides of the interior walls of the compartment. The shelf shall include a 1.00 inch lip around the edges. The shelf shall be finished the same as the interior of the compartment.		
63.	<u>EMS COMPARTMENT LIGHTING</u> The interior portion of each of the EMS compartments shall include door activated LED lighting to illuminate all usable surfaces within each compartment.		
64.	<u>ENGINE</u> The chassis engine shall be a Cummins ISX12 engine. The ISX12 engine shall be an in-line six (6) cylinder, four cycle diesel powered engine. The engine shall offer a rating of 500 horse power at 1800 RPM and shall be governed at 2100 RPM. The torque rating shall feature 1645 foot pounds of torque at 1200 RPM with 729 cubic inches (11.9 liter) of displacement.		
A			
B	The ISX12 engine shall feature a VGT™ Turbocharger, a high pressure common rail fuel system, fully integrated electronic controls with an electronic governor, and shall be EPA certified to meet the 2013 emissions standards using cooled exhaust gas recirculation and selective catalytic reduction technology.		
C	The engine shall include an engine mounted combination full flow/by-pass oil filter with replaceable spin on cartridge for use with the engine lubrication system. The engine shall include Citgo brand Citgard 500, or equivalent SAE 15W40 CJ4 low ash engine oil which shall be utilized for proper engine lubrication.		
D	A wiring harness shall be supplied ending at the back of the cab. The harness shall include a connector which shall allow an optional harness for the pump panel. The included circuits shall be provided for a tachometer, oil pressure, engine temperature, hand throttle, high idle and a PSG system. A circuit for J1939 data link shall also be provided at the back of the cab.		
65.	<u>CAB ENGINE TUNNEL</u> The cab interior shall include an integrated engine tunnel constructed of 5052-H32 Marine Grade 0.19 of an inch thick aluminum alloy plate. The tunnel shall be a maximum of 46.50 inches wide X 29.00 inches high.		
66.	<u>DIESEL PARTICULATE FILTER CONTROLS</u> There shall be two (2) controls for the diesel particulate filter. One (1) control shall be for regeneration and one (1) control shall be for regeneration inhibit.		
67.	<u>ENGINE PROGRAMMING HIGH IDLE SPEED</u> The engine high idle control shall maintain the engine idle at approximately 1250 RPM when engaged.		

68.	<u>ENGINE HIGH IDLE CONTROL</u>		
	The vehicle shall be equipped with an automatic high-idle speed control. It shall be pre-set so when activated, it will operate the engine at the appropriate RPM to increase alternator output. This device shall operate only when the master switch is activated and the transmission is in neutral with the parking brake set. The device shall disengage when the operator depresses the brake pedal, or the transmission is placed in gear, and shall be available to manually or automatically re-engage when the brake is released, or when the transmission is placed in neutral. There shall be an indicator on the Vista display and control screen for the high idle speed control.		
69.	<u>ENGINE PROGRAMMING ROAD SPEED GOVERNOR</u>		
	The engine shall include programming which will govern the top speed of the vehicle.		
70.	<u>AUXILIARY ENGINE BRAKE</u>		
	A compression brake, for the six (6) cylinder engine shall be provided. A cutout relay shall be installed to disable the compression brake when in pump mode or when an ABS event occurs. The engine compression brake shall activate upon 0% accelerator when in operation mode and actuate the vehicle's brake lights.		
	The engine shall utilize a variable geometry turbo (VGT) as an integrated auxiliary engine brake to offer a variable rate of exhaust flow, which when activated in conjunction with the compression brake shall enhance the engine's compression braking capabilities.		
71.	<u>AUXILIARY ENGINE BRAKE CONTROL</u>		
A	An engine compression brake control device shall be included. The electronic control device shall monitor various conditions and shall activate the engine brake only if all of the following conditions are simultaneously detected:		
	<ul style="list-style-type: none"> • A valid gear ratio is detected. 		
	<ul style="list-style-type: none"> • The driver has requested or enabled engine compression brake operation. 		
	<ul style="list-style-type: none"> • The throttle is at a minimum engine speed position. 		
	<ul style="list-style-type: none"> • The electronic controller is not presently attempting to execute an electronically controlled final drive gear shift. 		
B	The compression brake shall be controlled via an off/low/medium/high virtual button on the Vista display and control screen. The multiplex system shall remember and default to the last engine brake control setting when the vehicle is shut off and re-started.		
72.	<u>ELECTRONIC ENGINE OIL LEVEL INDICATOR</u>		
	The engine oil shall be monitored electronically and shall send a signal to activate a warning in the instrument panel when levels fall below normal. The warning shall activate in a low oil situation upon turning on the master battery and ignition switches without the engine running.		
73.	<u>FLUID FILLS</u>		
	The front of the chassis shall accommodate fluid fill for the engine oil through the grille. This area shall also accommodate a check for the engine oil. The transmission, power steering, and coolant fluid fills and checks shall be under the cab. The windshield washer fill shall be accessible through the front left side mid step.		
74.	<u>ENGINE WARRANTY</u>		
	The Cummins engine shall be warranted for a period of five (5) years or 100,000 miles, whichever occurs first.		

75.	<u>ENGINE PROGRAMMING REMOTE THROTTLE</u> The engine ECM (Electronic Control Module) discreet wire remote throttle circuit shall be turned off for use with a J1939 based pump controller or when the discreet wire remote throttle controls are not required.		
76.	<u>ENGINE PROGRAMMING IDLE SPEED</u>		
A	The engine low idle speed will be programmed at 700 rpm.		
77.	<u>ENGINE FAN DRIVE</u>		
A	The engine cooling system fan shall incorporate a thermostatically controlled, Horton clutched type fan drive. The clutch fan shall automatically engage in pump mode.		
B	When the clutched fan is disengaged it shall facilitate improved vehicle performance, cab heating in cold climates, and fuel economy. The fan clutch design shall be fail safe so that if the clutch drive fails the fan shall engage to prevent engine overheating due to the fan clutch failure.		
78.	<u>ENGINE COOLING SYSTEM</u>		
A	There shall be a heavy-duty aluminum cooling system designed to meet the demands of the emergency response industry. The cooling system shall have the capacity to keep the engine properly cooled under all conditions of road and pumping operations. The cooling system shall be designed and tested to meet or exceed the requirements specified by the engine and transmission manufacturer and all EPA requirements. The complete cooling system shall be mounted to isolate the entire system from vibration or stress. The individual cores of the cooling system shall be mounted in a manner to allow expansion and contraction at various rates without inducing stress into the adjoining cores.		
B	The cooling system shall be comprised of a charge air cooler to radiator serial flow package that provides the maximum cooling capacity for the specified engine as well as serviceability. The main components shall include a surge tank, a charge air cooler bolted to the front of the radiator, recirculation shields, a shroud, a fan, and required tubing.		
C	The radiator shall be a down-flow design constructed with aluminum cores, plastic end tanks, and a steel frame. The radiator shall be equipped with a drain cock to drain the coolant for serviceability.		
D	The cooling system shall include a one piece injected molded polymer fan with a three (3) piece fiberglass fan shroud.		
E	The cooling system shall be equipped with a surge tank that is capable of removing entrained air from the system. The surge tank shall be equipped with a low coolant probe and rearward oriented sight glass to monitor the level of the coolant. The surge tank shall have a dual seal cap that meets the engine manufacturer's pressure requirements, and allows for expansion and recovery of coolant into a separate integral expansion chamber		
F	All radiator tubes shall be formed from aluminized steel tubing. Recirculation shields shall be installed where required to prevent heated air from reentering the cooling package and affecting performance		
G	The charge air cooler shall be a cross-flow design constructed completely of aluminum with cast tanks. All charge air cooler tubes shall be formed from aluminized steel tubing and installed with silicone hump hoses and stainless steel "constant torque" style clamps meeting the engine manufacturer's requirements.		
H	The radiator and charge air cooler shall be removable through the bottom of the chassis.		

79.	<u>ENGINE COOLING SYSTEM PROTECTION</u>		
	The engine cooling system shall include a recirculation shield designed to act as a light duty skid plate below the radiator to provide additional protection for the engine cooling system from light impacts, stones, and road debris. The skid plate shall be painted to match the frame color.		
80.	<u>ENGINE COOLANT</u>		
A	The cooling package shall include Extended Life Coolant (ELC). The use of ELC provides longer intervals between coolant changes over standard coolants providing improved performance. The coolant shall contain a 50/50 mix of ethylene glycol and de-ionized water to keep the coolant from freezing to a temperature of -34 degrees Fahrenheit.		
B	Proposals offering supplemental coolant additives (SCA) shall not be considered, as this is part of the extended life coolant makeup.		
	<u>ENGINE COOLANT FILTER</u>		
A	An engine coolant filter with a shut-off valve for the inlet and outlet shall be installed on the chassis. The location of the filter shall allow for easy maintenance.		
B	Proposals offering engines equipped with coolant filters shall be supplied with standard non-chemical type particulate filters.		
81.	<u>ELECTRONIC COOLANT LEVEL INDICATOR</u> The instrument panel shall feature a low engine coolant indicator light which shall be located in the center of the instrument panel. An audible tone alarm shall also be provided to warn of a low coolant incident.		
82.	<u>ENGINE PUMP HEAT EXCHANGER</u>		
	A single bundle type coolant to water heat exchanger shall be installed between the engine and the radiator. The heat exchanger shall be designed to prohibit water from the pump from coming in contact with the engine coolant. This shall allow the use of water from the discharge side of the pump to assist in cooling the engine.		
83.	<u>COOLANT HOSES</u>		
	The cooling system hoses shall be silicone heater hose with rubber hoses in the cab interior. The radiator hoses shall be formed silicone coolant hoses with formed aluminized steel tubing. All heater hose, silicone coolant hose, and tubing shall be secured with stainless steel constant torque band clamps.		
84.	<u>ENGINE AIR INTAKE</u>		
A	The engine air intake system shall include an ember separator air intake filter which shall be located behind the right hand side headlamp. This filter ember separator shall be designed to protect the downstream air filter from embers, using a combination of unique flat and crimped metal screens packaged in a corrosion resistant heavy duty galvanized steel frame. This multilayered screen shall be design traps embers and allows them to burn out before passing through the pack.		
B	The engine air intake system shall also include a stainless steel air cleaner mounted to the frame and located beneath the cab on the right side of the vehicle. The air cleaner shall utilize a replaceable filter element designed to prevent dust and debris from being ingested into the engine. The air cleaner housing and connections in the air intake system shall be designed to mitigate water intrusion into the system during severe weather conditions.		
C	The air intake system shall also include a restriction indicator light in the warning light cluster on the instrument panel, which shall activate when the air cleaner element requires replacement.		

85.	<u>AIR INTAKE PROTECTION</u>		
	A light duty skid plate shall be supplied for the engine air intake system below the right front side of the cab. The skid plate shall provide protection for the air intake system from light impacts, stones, and road debris. The skid plate shall be painted to match the frame color.		
86.	<u>ENGINE EXHAUST SYSTEM</u>		
A	The exhaust system shall include a diesel particulate filter (DPF), a diesel oxidation catalyst, and a selective catalytic reduction (SCR) catalyst to meet current EPA standards. The selective catalytic reduction catalyst utilizes a diesel exhaust fluid solution consisting of urea and purified water to convert NOx into nitrogen, water, and trace amounts of carbon dioxide. The solution shall be injected into the system through the decomposition tube between the DPF and SCR.		
B	The system shall utilize 0.07 inch thick stainless steel exhaust tubing between the engine turbo and the DPF. Zero leak clamps seal all system joints between the turbo and DPF.		
C	The DPF, the decomposition tube, and the SCR canister through the end of the tailpipe shall be connected with zero leak clamps. The discharge shall terminate horizontally on the right side of the vehicle ahead of the rear tires.		
D	The exhaust system shall be mounted below the frame in the outboard position with the SCR canister in line rearward of the DPF.		
87.	<u>DIESEL EXHAUST FLUID TANK</u>		
A	The exhaust system shall include a molded cross linked polyethylene tank for Diesel Exhaust Fluid (DEF). The tank shall have a capacity of six (6) usable gallons and shall be mounted on the left hand side of the chassis frame behind the batteries below the frame.		
B	The DEF tank shall be designed with capacity for expansion in case of fluid freezing. Engine coolant, which shall be thermostatically controlled, shall be run through lines in the tank to help prevent the DEF from freezing and to provide a means of thawing the fluid if it should become frozen.		
C	The tank fill tube shall be routed under the rear of the cab with the fill neck and splash guard accessible in the top rear step.		
88.	<u>ENGINE EXHAUST ACCESSORIES</u>		
A	The exhaust system shall be modified to accept a Nederman 45-degree exhaust extraction system.		
89.	<u>ENGINE EXHAUST WRAP</u>		
	The exhaust tubing between the engine turbo and the diesel particulate filter (DPF) shall be wrapped with a thermal cover in order to retain the necessary heat for DPF regeneration. The exhaust wrap shall also help protect surrounding components from radiant heat which can be transferred from the exhaust.		
90.	<u>TRANSMISSION</u>		
A	The drive train shall include an Allison model EVS 4000 torque converting, automatic transmission which shall include electronic controls. The transmission shall feature two (2) 10-bolt PTO pads located on the converter housing.		

B	The transmission shall include two (2) internal oil filters which shall offer Castrol TranSynd™ synthetic TES 295 transmission fluid which shall be utilized in the lubrication of the EVS transmission. An electronic oil level sensor shall be included with the readout located in the shift selector.		
C	The transmission gear ratios shall be:		
	1st 3.51:1		
	2nd 1.91:1		
	3rd 1.43:1		
	4th 1.00:1		
	5th 0.74:1		
	6th 0.64:1 (if applicable)		
	Rev 4.80:1		
91.	<u>TRANSMISSION MODE PROGRAMMING</u>		
A	The transmission, upon start-up, will select the fifth speed operation without the need to press the mode button.		
92.	<u>TRANSMISSION FEATURE PROGRAMMING</u>		
A	The Allison Gen V-E transmission EVS group package number 127 shall contain the 198 vocational package in consideration of the duty of this apparatus as a pumper. This package shall incorporate an automatic neutral with selector override. This feature commands the transmission to neutral when the park brake is applied, regardless of drive range requested on the shift selector. This requires re-selecting drive range to shift out of neutral for the override.		
B	This package shall be coupled with the use of a split shaft PTO and incorporate pumping circuits. These circuits shall be used allowing the vehicle to operate in the fourth range lockup while operating the pump mode due to the 1 to 1 ratio through the transmission, therefore the output speed of the engine is the input speed to the pump. The pump output can be easily calculated by using this input speed and the drive ratio of the pump itself to rate the gallons of water the pump can provide.		
C	A transmission interface connector shall be provided in the cab. This package shall contain the following input/output circuits to the transmission control module. The Gen V-E transmission shall include prognostic diagnostic capabilities. These capabilities shall include the monitoring of the fluid life, filter change indication, and transmission clutch maintenance.		
	<u>Function ID</u> <u>Description</u> <u>Wire assignment</u>		
	Inputs:		
	C PTO Request 142		
	J Fire Truck Pump Mode (4th Lockup) 122 / 123		
	Outputs:		
	C Range Indicator 145 (4th)		
	G PTO Enable Output 130		
	Signal Return 103		
93.	<u>ELECTRONIC TRANSMISSION OIL LEVEL INDICATOR</u> The transmission fluid shall be monitored electronically and shall send a signal to activate a warning in the instrument panel when levels fall below normal.		

94.	<u>TRANSMISSION SHIFT SELECTOR</u>		
	An Allison pressure sensitive range selector touch pad shall be provided and located to the right of the driver within clear view and easy reach. The shift selector shall have a graphical Vacuum Florescent Display (VFD) capable of displaying two lines of text. The shift selector shall provide mode indication and a prognostic indicator (wrench symbol) on the digital display. The prognostics monitor various operating parameters and shall alert you when a specific maintenance function is required.		
95.	<u>TRANSMISSION PRE-SELECT WITH AUXILIARY BRAKE</u>		
	When the auxiliary brake is engaged, the transmission shall automatically shift to second gear to decrease the rate of speed assisting the secondary braking system and slowing the vehicle.		
96.	<u>TRANSMISSION COOLING SYSTEM</u>		
	The transmission shall include a water to oil cooler system located in the cooling loop between the radiator and the engine. The transmission cooling system shall meet all transmission manufacturer requirements. The transmission cooling system shall feature continuous flow of engine bypass water to maintain uninterrupted transmission cooling.		
97.	<u>TRANSMISSION WARRANTY</u>		
	The Allison EVS series transmission shall be warranted for a period of five (5) years with unlimited mileage. Parts and labor shall be included in the warranty.		
98.	<u>PTO LOCATION</u>		
	The transmission shall have two (2) power take off (PTO) mounting locations, one (1) in the 8:00 o'clock position and one (1) in the 1:00 o'clock position.		
99.	<u>DRIVELINE</u>		
	All drivelines shall be heavy duty metal tube and equipped with Spicer 1810 series universal joints. The shafts shall be dynamically balanced prior to installation to alleviate future vibration. In areas of the driveline where a slip shaft is required, the splined slip joint shall be coated with Glide Coat®.		
100.	<u>MIDSHIP PUMP / GEARBOX</u>		
	A temporary jackshaft driveline shall be installed by the chassis manufacturer to accommodate the mid-ship split shaft pump as specified by the apparatus manufacturer.		
101.	<u>MIDSHIP PUMP / GEARBOX MODEL</u>		
	The mid-ship pump/gearbox provisions shall be for a Waterous CSUC20 pump.		
102.	<u>MIDSHIP PUMP GEARBOX DROP</u>		
	The Waterous pump gearbox shall have a "C" (medium length) drop length.		
103.	<u>MIDSHIP PUMP RATIO</u>		
	The ratio for the midship pump shall be 2.27:1.		
104.	<u>MIDSHIP PUMP LOCATION C/L SUCTION TO C/L REAR AXLE</u>		
	The midship pump shall be located so the dimension from the centerline of the suction to the centerline of the rear axle is 80.00 inches.		
105.	<u>FUEL FILTER/WATER SEPARATOR</u>		
A	The fuel system shall have a Fleetguard FS1003 fuel filter/water separator as a primary filter. The fuel filter shall have a drain valve.		
B	A water in fuel sensor shall be provided and wired to an instrument panel lamp and audible alarm to indicate when water is present in the fuel/water separator.		
C	A secondary fuel filter shall be included as approved by the engine manufacturer.		
106.	<u>FUEL LINES</u>		

	The fuel system supply and return lines installed from the fuel tank to the engine shall be black textile braided lines which are reinforced with braided high tensile steel wire. The fuel lines shall be connected with reusable steel fittings.		
107.	<u>FUEL SHUTOFF VALVE</u>		
A	A fuel shutoff valve shall be installed in the fuel draw line at the primary fuel filter to allow the fuel filter to be changed without loss of fuel to the fuel pump.		
B	A second fuel shutoff valve shall be installed in the fuel draw line, near the fuel tank to allow maintenance to be performed with minimal loss of fuel.		
108.	<u>ELECTRIC FUEL PRIMER</u> Integral to the engine assembly is an electric lift pump that serves the purpose of pre-filter fuel priming.		
109.	<u>FUEL COOLER</u> An aluminum cross flow air to fuel cooler shall be provided to lower fuel temperature allowing the vehicle to operate at higher ambient temperatures. The fuel cooler shall be located above the fuel tank.		
110.	<u>FUEL TANK</u>		
A	The fuel tank shall have a capacity of sixty-eight (68) gallons and shall measure 35.00 inches in width X 17.00 inches in height X 29.00 inches in length.		
B	The baffled tank shall have a vent port to facilitate venting to the top of the fill neck for rapid filling without "blow-back" and a roll over ball check vent for temperature related fuel expansion and draw.		
C	The tank is designed with dual draw tubes and sender flanges. The tank shall have 2.00 inch NPT fill ports for right or left hand fill. A 0.50 inch NPT drain plug shall be centered in the bottom of the tank.		
D	The fuel tank shall be mounted below the frame, behind the rear axle. Two (2) three-piece strap hanger assemblies with "U" straps bolted midway on the fuel tank front and rear shall be utilized to allow the tank to be easily lowered and removed for service purposes. Rubber isolating pads shall be provided between the tank and the upper tank mounting brackets. Strap mounting studs through the rail, hidden behind the body shall not be acceptable.		
111.	<u>FUEL TANK MATERIAL AND FINISH</u>		
A	The fuel tank shall be constructed of 12 gauge aluminized steel. The exterior of the tank shall be powder coated black and then painted to match the frame color.		
B	All powder coatings, primers and paint shall be compatible with all metals, pretreatments and primers used. The cross hatch adhesion test per ASTM D3359 Method B, results to be 5B minimum. The pencil hardness test per ASTM D3363 shall have a final post-cured pencil hardness of H-2H. The direct impact resistance test per ASTM D2794, results to be 5B minimum.		
C	Any proposals offering painted fuel tanks with variations from the above process shall not be accepted. The film thickness of vendor supplied parts shall also be sufficient to meet the performance standards as stated above.		
112.	<u>FUEL TANK STRAP MATERIAL</u>		
	The fuel tank straps shall be constructed of ASTM A-36 steel. The fuel tank straps shall be powder coated black and then painted to match the frame color if applicable.		

113.	<u>FUEL TANK FILL PORT</u>		
	The fuel tank fill ports shall be provided with two (2) left fill ports located one (1) in the forward position and one (1) in the middle position and the right fill port located in the middle position of the fuel tank.		
114.	<u>FUEL TANK SERVICEABILITY PROVISIONS</u>		
	The chassis fuel lines shall have additional length provided so the tank can be easily lowered and removed for service purposes. The additional 8.00 feet of length shall be located above the fuel tank and shall be coiled and secured. The fuel line fittings shall be pointed towards the right side (curbside) of the chassis.		
115.	<u>FUEL TANK DRAIN PLUG</u>		
	A 0.5 inch NPT drain plug shall be centered in the bottom of the fuel tank.		
116.	<u>FRONT AXLE</u>		
	The front axle shall be a Meritor Easy Steer Non drive front axle, model number MFS-20. The axle shall include a 3.74 inch drop and a 71.00 inch king pin intersection (KPI). The axle shall include a conventional style hub with a standard knuckle. The weight capacity for the axle shall be rated to 21,500 pounds FAWR.		
117.	<u>FRONT AXLE WARRANTY</u>		
	The front axle shall be warranted by Meritor for two (2) years with unlimited miles under the general service application. Details of the Meritor warranty are provided on the PDF document attached to this option.		
118.	<u>INDEPENDENT FRONT SUSPENSION IPO SPECIFIED FRONT AXLE</u>		
	If available please provide cost of independent front suspension in place of Meritor Easy Steer system specified. Independent front suspension will not be considered as part of bid award.		
119.	<u>FRONT WHEEL BEARING LUBRICATION</u>		
	The front axle wheel bearings shall be lubricated with oil. The oil level can be visually checked via clear inspection windows in the front axle hubs.		
120.	<u>FRONT SHOCK ABSORBERS</u>		
A	Two (2) Bilstein inert, nitrogen gas filled shock absorbers shall be provided and installed as part of the front suspension system. The shocks shall be a monotubular design and fabricated using a special extrusion method, utilizing a single blank of steel without a welded seam, achieving an extremely tight peak-to-valley tolerance and maintains consistent wall thickness. The monotubular design shall provide superior strength while maximizing heat dissipation and shock life.		
B	The ride afforded through the use of a gas shock is more consistent and shall not deteriorate with heat, the same way a conventional oil filled hydraulic shock would.		
C	The Bilstein front shocks shall include a digressive working piston assembly allowing independent tuning of the compression and rebound damping forces to provide optimum ride and comfort without compromise. The working piston design shall feature fewer parts than most conventional twin tube and “road sensing” shock designs and shall contribute to the durability and long life of the Bilstein shock absorbers.		
D	Proposals offering the use of conventional twin tube or “road sensing” designed shocks shall not be considered.		

121.	<u>FRONT SUSPENSION</u>		
	The front suspension shall include a ten (10) leaf spring pack in which the longest leaf measures 54.00 inch long and 4.00 inches wide and shall include a military double wrapped front eye. Both spring eyes shall have a case hardened threaded bushing installed with lubrication counter bore and lubrication land off cross bore with grease fitting. The spring capacity shall be rated at 21,500 pounds.		
122.	<u>STEERING COLUMN/ WHEEL</u>		
A	The cab shall include a Douglas Autotech steering column which shall include a seven (7) position tilt, a 2.25 inch telescopic adjustment, and an 18.00 inch, four (4) spoke steering wheel located at the driver's position. The steering wheel shall be covered with black polyurethane foam padding.		
B	The steering column shall contain a horn button, self-canceling turn signal switch, four-way hazard switch and headlamp dimmer switch.		
123.	<u>ELECTRONIC POWER STEERING FLUID LEVEL INDICATOR</u>		
	The power steering fluid shall be monitored electronically and shall send a signal to activate an audible alarm and visual warning in the instrument panel when fluid level falls below normal.		
124.	<u>POWER STEERING PUMP</u>		
	The hydraulic power steering pump shall be a TRW PS and shall be gear driven from the engine. The pump shall be a balanced, positive displacement, sliding vane type. The power steering system shall include an oil to air passive cooler.		
125.	<u>FRONT AXLE CRAMP ANGLE</u>		
	The chassis shall have a front axle cramp angle of 48-degrees to the left and 44-degrees to the right.		
126.	<u>POWER STEERING GEAR</u>		
	The power steering gear shall be a TRW model TAS 85 with an assist cylinder.		
127.	<u>CHASSIS ALIGNMENT</u>		
	The chassis frame rails shall be measured to insure the length is correct and cross checked to make sure they run parallel and are square to each other. The front and rear axles shall be laser aligned. The front tires and wheels shall be aligned and toe-in set on the front tires by the chassis manufacturer.		
128.	<u>REAR AXLE</u>		
A	The rear axle shall be a Meritor model RS-25-160 single drive axle. The axle shall include precision forged, single reduction differential gearing, and shall have a fire service rated capacity of 27,000 pounds.		
B	The axle shall be built of superior construction and quality components to provide the rugged dependability needed to stand up to the fire industry's demands. The axle shall include rectangular shaped, hot-formed housing with a standard wall thickness of 0.63 of an inch for extra strength and rigidity and a rigid differential case for high axle strength and reduced maintenance.		
C	The axle shall have heavy-duty Hypoid gearing for longer life, greater strength and quieter operation. Industry-standard wheel ends for compatibility with both disc and drum brakes, and unitized oil seal technology to keep lubricant in and help prevent contaminant damage will be used.		
129.	<u>REAR AXLE DIFFERENTIAL LUBRICATION</u>		

	The rear axle differential shall be lubricated with oil.		
130.	<u>REAR AXLE WARRANTY</u> The rear axle shall be warranted by Meritor for two (2) years with unlimited miles under the general service application. Details of the Meritor warranty are provided on the PDF document attached to this option.		
131.	<u>REAR WHEEL BEARING LUBRICATION</u>		
	The rear axle wheel bearings shall be lubricated with oil.		
132.	<u>VEHICLE TOP SPEED</u>		
	The top speed of the vehicle shall be approximately 75 MPH +/-2 MPH at governed engine RPM.		
133.	<u>REAR SUSPENSION</u>		
A	The single rear axle shall feature a Hendrickson Firemaax™ air suspension. The suspension shall include two optimized air springs mounted to cast structural trailing arms, a transverse cross beam for increased roll stability and two heavy duty shock absorbers. Dual air height control valves shall be installed to ensure equal frame height on both sides of the vehicle regardless of the load. Axle alignment is maintained using two eccentric bushings at each frame bracket.		
B	The rear suspension capacity shall be rated at 27,000 pounds.		
134.	<u>REAR SHOCK ABSORBERS</u> Shock absorbers shall be supplied by the suspension manufacturer and installed on the rear axle suspension.		
135.	<u>FRONT TIRE</u>		
A	The front tires shall be Michelin 425/65R-22.5 20PR "L" tubeless radial XZY3 mixed service tread.		
B	The front tire stamped load capacity shall be 22,800 pounds per axle with a nominal speed rating of 65 miles per hour when properly inflated to 120 pounds per square inch.		
C	The Michelin Intermittent Service Rating maximum load capacity shall be 24,396 pounds per axle with a maximum speed of 65 miles per hour when properly inflated to 120 pounds per square inch.		
D	The Michelin Intermittent Service Rating maximum speed capacity shall be 22,800 pounds per axle with a speed rating of 75 miles per hour when properly inflated to 120 pounds per square inch.		
E	The Michelin Intermittent Service Rating limits the operation of the emergency vehicle to no more than fifty (50) miles of continuous operation under maximum recommended payload, or without stopping for at least twenty (20) minutes. The emergency vehicle must reduce its speed to no more than 50 MPH after the first fifty (50) miles of travel.		
136.	<u>REAR TIRE</u>		
A	The rear tires shall be Michelin 12R-22.5 16PR "H" tubeless radial XDN2 all-weather tread.		
B	The rear tire stamped load capacity shall be 27,120 pounds per axle with a nominal speed rating of 75 miles per hour when properly inflated to 120 pounds per square inch.		
C	The Michelin Intermittent Service Rating maximum load capacity shall be 29,020 pounds per axle with a maximum speed of 75 miles per hour when properly inflated to 120 pounds per square inch.		
D	The Michelin Intermittent Service Rating maximum speed capacity shall match the nominal speed rating.		

E	The Michelin Intermittent Service Rating limits the operation of the emergency vehicle to no more than fifty (50) miles of continuous operation under maximum recommended payload, or without stopping for at least twenty (20) minutes. The emergency vehicle must reduce its speed to no more than 50 MPH after the first fifty (50) miles of travel.		
137.	<u>REAR AXLE RATIO</u>		
	The rear axle ratio shall be 4.56:1.		
138.	<u>TIRE PRESSURE INDICATOR</u>		
	There shall be electronic chrome LED valve caps shipped loose for installation by the OEM which shall illuminate with a red LED when tire pressure drops 8psi provided. The valve caps are self-calibrating and set to the pressure of the tire upon installation.		
139.	<u>FRONT WHEEL</u>		
	The front wheels shall be Alcoa hub piloted, 22.50 inch X 12.25 inch LvL One™ polished aluminum wheels. The hub piloted mounting system shall provide easy installation and shall include two-piece flange nuts. The wheels shall feature one-piece forged strength and a polished finish that lasts.		
140.	<u>REAR WHEEL</u>		
	The outer rear wheels shall be Alcoa hub piloted, 22.50 inch X 8.25 inch LvL One™ aluminum wheels with a polished outer surface. The inner rear wheels shall be Alcoa hub piloted, 22.50 inch X 8.25 inch aluminum wheels with LvL One™ bright machine finish. The hub piloted mounting system shall provide easy installation and shall include two-piece flange nuts.		
141.	<u>BALANCE WHEELS AND TIRES</u>		
	All of the wheels and tires, including any spare wheels and tire assemblies, shall be dynamically balanced.		
142.	<u>WHEEL TRIM</u>		
A	The front wheels shall include stainless steel lug nut covers and stainless steel baby moons shipped loose with the chassis for installation by the apparatus builder. The baby moons shall have cutouts for oil seal viewing when applicable.		
B	The rear wheels shall include stainless steel lug nut covers and band mounted spring clip stainless steel high hats shipped loose with the chassis for installation by the apparatus builder.		
C	The lug nut covers, baby moons, and high hats shall be RealWheels® brand constructed of 304L grade, non-corrosive stainless steel with a mirror finish. Each wheel trim component shall meet D.O.T. certification.		
143.	<u>TIRE CHAINS</u>		
	Onspot brand six (6) strand automatic ice chains shall be installed on the rear axle of the chassis to provide instant traction while traveling on ice and snow at speeds below 35 MPH.		

144.	<u>TIRE CHAINS ACTIVATION</u>		
	The tire chain system shall be activated by a virtual button on the Vista display and control screen. The virtual button shall display “Active” when the tire chains are engaged. The tire chains shall be interlocked with the transmission and shall engage only if the vehicle is traveling 30 MPH or less. After traveling over 30 MPH, the vehicle must be reduced to a speed below 5 MPH for the tire chains to be engaged or re-engaged. The virtual button, once the vehicle reaches 35 MPH shall be reset to “Inactive”. The vehicle must then reduce to a speed below 5 MPH to enable the tire chains virtual button.		
145.	<u>AUXILIARY LUBRICATION SYSTEM</u>		
	An SKF centralized lubrication system (formerly Vogel) shall be installed on the chassis. The system shall be capable of lubricating up to twenty-four (24) grease points on the chassis. A park brake interlock is incorporated into the ignition system to keep the system from operating while parked. A system diagnostic indicator light shall be provided on the dash. The main line system shall be monitored via a pressure switch. The system shall be mounted on the left hand frame rail.		
146.	<u>BRAKE SYSTEM</u>		
A	A rapid build-up air brake system shall be provided. The air brakes shall include a two (2) air tank, three (3) reservoir system with a total of 4152 cubic inch of air capacity. A floor mounted treadle valve shall be mounted inside the cab for graduated control of applying and releasing the brakes. An inversion valve shall be installed to provide a service brake application in the unlikely event of primary air supply loss. All air reservoirs provided on the chassis shall be labeled for identification.		
B	The rear axle spring brakes shall automatically apply in any situation when the air pressure falls below 25 PSI and shall include a mechanical means for releasing the spring brakes when necessary. An audible alarm shall designate when the system air pressure is below 60 PSI.		
C	A four (4) sensor, four (4) modulator Anti-lock Braking System (ABS) shall be installed on the front and rear axles in order to prevent the brakes from locking or skidding while braking during hard stops or on icy or wet surfaces. This in turn shall allow the driver to maintain steering control under heavy braking and in most instances, shorten the braking distance. The electronic monitoring system shall incorporate diagonal circuitry which shall monitor wheel speed during braking through a sensor and tone ring on each wheel. A dash mounted ABS lamp shall be provided to notify the driver of a system malfunction. The ABS system shall automatically disengage the auxiliary braking system device when required. The speedometer screen shall be capable of reporting all active defaults using PID/SID and FMI standards.		
D	Additional safety shall be accommodated through Automatic Traction Control (ATC) which shall be installed on the single rear axle. The ATC system shall apply the ABS when the drive wheels loose traction. The system shall scale the electronic engine throttle back to prevent wheel spin while accelerating on ice or wet surfaces.		
E	A virtual style switch shall be provided and properly labeled “mud/snow”. When the switch is pressed once, the system shall allow a momentary wheel slip to obtain traction under extreme mud and snow conditions. During this condition the ATC light shall blink continuously notifying the driver of activation. Pressing the switch again shall deactivate the mud/snow feature.		

F	The Electronic Stability Control (ESC) unit is a functional extension of the electronic braking system. It is able to detect any skidding of the vehicle about its vertical axis as well as any rollover tendency. The control unit comprises an angular-speed sensor that measures the vehicle's motion about the vertical axis, caused, for instance, by cornering or by skidding on a slippery road surface. An acceleration sensor measures the vehicle's lateral acceleration. The Controller Area Network (CAN) bus provides information on the steering angle. On the basis of lateral acceleration and steering angle, an integrated microcontroller calculates a theoretical angular speed for the stable vehicle condition.		
147.	<u>FRONT BRAKES</u>		
	The front brakes shall be Meritor EX225 Disc Plus disc brakes with 17.00 inch vented rotors.		
148.	<u>REAR BRAKES</u>		
	The rear brakes shall be Meritor 16.50 inch X 7.00 inch S-cam drum type. The brakes shall feature a cast iron shoe.		
149.	<u>PARK BRAKE</u>		
	Upon application of the push-pull valve in the cab, the rear brakes will engage via mechanical spring force. This is accomplished by dual chamber rear brakes, satisfying the FMVSS parking brake requirements.		
150.	<u>PARK BRAKE CONTROL</u> A Meritor-Wabco manual hand control push-pull style valve shall operate the parking brake.		
A	The parking brake actuation valve shall be mounted to the left side of the engine tunnel integrated into the transmission shift pod console within easy access of the driver.		
B	Park brake shall be set automatically when neutral shift has been selected.		
151.	<u>REAR BRAKE SLACK ADJUSTERS</u>		
	The rear brakes shall include Meritor automatic slack adjusters installed on the axle which features a simple, durable design offering reduced weight. The automatic slack adjusters shall feature a manual adjusting nut which cannot inadvertently be backed off and threaded grease fittings for easy serviceability.		
152.	<u>AIR DRYER</u>		
	The brake system shall include a Wabco System Saver 1200 air dryer with an integral heater with a Metri-Pack sealed connector. The air dryer incorporates an internal turbo cutoff valve that closes the path between the air compressor and air dryer purge valve during the compressor "unload" cycle. The turbo cutoff valve allows purging of moisture and contaminants without the loss of turbo boost pressure. The air dryer shall be mounted behind the battery box on the left hand side.		
153.	<u>FRONT BRAKE CHAMBERS</u>		
	The front brakes shall be provided with MGM type 24 long stroke brake chambers.		
154.	<u>REAR BRAKE CHAMBERS</u>		
	The rear axle shall include TSE 30/36 brake chambers which shall convert the energy of compressed air into mechanical force and motion. This shall actuate the brake camshaft, which in turn shall operate the foundational brake mechanism forcing the brake shoes against the brake drum. The TSE Type 36 brake chamber has a 36.00 square inch effective area.		

155.	<u>AIR COMPRESSOR</u>		
	The air compressor provided for the engine shall be a Wabco® SS318 single cylinder pass-through drive type compressor which shall be capable of producing 18.7 CFM at 1200 engine RPMs. The air compressor shall feature a higher delivery efficiency translating to more air delivery per horsepower absorbed. The compressor shall include an aluminum cylinder head which shall improve cooling, reduce weight and decrease carbon formation. Superior piston and bore finishing technology shall reduce oil consumption and significantly increasing the system component life.		
156.	<u>AIR GOVERNOR</u>		
	An air governor shall be provided to control the cut-in and cut-out pressures of the engine mounted air compressor. The governor shall be calibrated to meet FMVSS requirements. The air governor shall be located on the air dryer bracket on the left frame rail behind the battery box.		
157.	<u>MOISTURE EJECTORS</u>		
	Heated, automatic moisture ejectors with a manual drain provision shall be installed on all reservoirs of the air supply system.		
158.	<u>AIR SUPPLY LINES</u>		
A	The air system on the chassis shall be plumbed with color coded reinforced nylon tubing air lines. The primary (rear) brake line shall be green, the secondary (front) brake line red, the parking brake line orange and the auxiliary (outlet) will be blue.		
B	Brass compression type fittings shall be used on the nylon tubing. All drop hoses shall include fiber reinforced neoprene covered hoses.		
159.	<u>REAR AIR TANK MOUNTING</u>		
	If a combination of wheel base, air tank quantity, or other requirements necessitate the location of one or more air tanks to be mounted rear of the fuel tank, these tank(s) will be mounted perpendicular to frame.		
160.	<u>WHEELBASE</u>		
	The chassis wheelbase shall be 210.00 inches.		
161.	<u>REAR OVERHANG</u>		
	The chassis rear overhang shall be 60.00 inches.		
162.	<u>FRAME</u>		
A	The frame shall consist of double rails running parallel to each other with cross members forming a ladder style frame. The frame rails shall be formed in the shape of a "C" channel, with the outer rail measuring 10.25 inches high X 3.50 inches deep upper and lower flanges X 0.38 inches thick with an inner channel of 9.44 inches high X 3.13 inches deep and 0.38 inches thick. Each rail shall be constructed of 110,000 psi minimum yield high strength low alloy steel. Each double rail section shall be rated by a Resistance Bending Moment (RBM) minimum of 3,213,100 inch pounds and have a minimum section modulus of 29.21 cubic inches. The frame shall measure 35.00 inches in width.		
B	Proposals calculating the frame strength using the "box method" shall not be considered.		
C	Proposals including heat treated rails shall not be considered. Heat treating frame rails produces rails that are not uniform in their mechanical properties throughout the length of the rail. Rails made of high strength, low alloy steel are already at the required yield strength prior to forming the rail.		

D	A minimum of seven (7) fully gusseted 0.25 inch thick cross members shall be installed. The inclusion of the body mounting, or bumper mounting shall not be considered as a cross member. The cross members shall be attached using zinc coated grade 8 fasteners. The bolt heads shall be flanged type, held in place by distorted thread flanged lock nuts. Each cross member shall be mounted to the frame rails utilizing a minimum of 0.25 inch thick gusset reinforcement plates at all corners balancing the area of force throughout the entire frame.		
E	Any proposals not including additional reinforcement for each cross member shall not be considered		
F	All relief areas shall be cut in with a minimum 2.00 inch radius at intersection points with the edges ground to a smooth finish to prevent a stress concentration point.		
G	The frame and cross members shall carry a lifetime warranty to the original purchaser. A copy of the frame warranty shall be made available upon request		
E	Proposals offering warranties for frames not including cross members shall not be considered.		
163.	<u>FRAME WARRANTY</u>		
	Summary of Warranty Terms:		
A	The frame and cross members shall carry a limited lifetime warranty to the original purchaser. The warranty period shall commence on the date the vehicle is delivered to the first end user.		
164.	<u>FRAME PAINT</u>		
A	The frame shall be powder coated black prior to any attachment of components.		
B	All powder coatings, primers and paint shall be compatible with all metals, pretreatments and primers used. The cross hatch adhesion test per ASTM D3359 shall not have a fail of more than ten (10) squares. The pencil hardness test per ASTM D3363 shall have a final post-curved pencil hardness of H-2H. The direct impact resistance test per ASTM D2794 shall have an impact resistance of 120.00 inches per pound at 2 mils.		
C	There shall be an RTV type sealant applied to the seams between the frame rail and the frame liner(s) to help prevent water intrusion between the frame rails. The sealant shall be applied to all seams along the length of the frame and at the front and rear ends of the liner(s). The sealant shall be applied after the frame rails have been assembled and painted.		
D	Any proposals offering painted frame with variations from the above process shall not be accepted. The film thickness of vendor supplied parts shall also be sufficient to meet the performance standards as stated above.		
E	The chassis under carriage consisting of frame, axles, driveline running gear, air tanks and other chassis mounted components shall be painted the primary/lower cab color. Paint shall be applied prior to airline and electrical wiring installation.		
165.	<u>FRONT BUMPER</u>		
	A one (1) piece, two (2) rib wrap-around style, polished stainless steel front bumper shall be provided. The material shall be 10 gauge 304 stainless steel, 12" high and 104.50 inches wide.		
166.	<u>FRONT BUMPER EXTENSION LENGTH</u>		
	The front bumper shall be extended approximately 24.00 inches ahead of the cab.		
167.	<u>FRONT BUMPER SUCTION PROVISION</u>		
A	The bumper apron shall include a 5.00 inch stainless steel pipe intended for use as a suction intake for the pump. The suction pipe shall be routed from the right hand front bumper area to the area rear of the front axle near the back of the cab.		

B	The front of the suction pipe shall be designed to extend vertically 2.00 inches above the top surface of the bumper in the right hand outboard position.		
C	The forward end of the suction pipe shall be finished with a 5.00 inch National Pipe Thread (NPT). The rear of the suction shall include a Victaulic groove for connecting to the pump plumbing. The suction pipe shall also include a 0.50 inch NPT port intended as a primer assist connection.		
D	The apparatus manufacturer shall plumb the suction pipe to the pump and shall provide all valves as required.		
168.	<u>FRONT BUMPER APRON</u>		
A	The 24.00 inch extended front bumper shall include an apron constructed of 0.19 inch thick embossed aluminum tread plate.		
B	The apron shall be installed between the bumper and the front face of the cab affixed using stainless steel bolts attaching the apron to the top bumper flange.		
169.	<u>FRONT BUMPER COMPARTMENT CENTER</u>		
	The front bumper shall include a hose tray compartment in the bumper apron located in the center that shall measure 58.00 inches wide X 6.00 inches deep. The compartment shall be constructed of 0.13 inch 5052-H32 grade aluminum and shall include drain holes in the bottom corners to allow excess moisture to escape. The compartment shall include a cover constructed of 0.19 inch thick bright embossed aluminum tread plate.		
170.	<u>FRONT BUMPER COMPARTMENT COVER HARDWARE</u> The front bumper compartments shall include a 7.00 inch stainless lift handle at the top center of the raised compartment cover(s). The raised cover(s) shall be held in the closed position via two (2) pull to release rubber "T" style hold down handles, located one (1) at each end of the cover. The flush cover(s) shall be held in the closed position via a D-ring style latch. Gas cylinder stays shall hold the covers open.		
171.	<u>MECHANICAL SIREN</u>		
	The front bumper shall include an electro mechanical Federal Q2B™ siren, which shall be streamlined, chrome-plated and shall produce 123 decibels of sound at 10.00 feet. The Q2B™ siren produces a distinctive warning sound that is recognizable at long distances. A unique clutch design provides a longer coast down sound while reducing the amp draw to 100 amps. The siren shall measure 10.50 inches wide X 10.00 inches high X 14.00 inches deep. The siren shall include a pedestal mount to surface mount on a horizontal surface.		
172.	<u>MECHANICAL SIREN LOCATION</u>		
	The siren shall be pedestal mounted on the bumper apron on the furthest outboard section of the bumper on the driver side.		
173.	<u>AIR HORN</u>		
	The chassis shall include two (2) Grover brand Stutter Tone air horns which shall measure 24.50 inches long with a 6.00 inch round flare. The air horns shall be trumpet style with a chrome finish.		
174.	<u>AIR HORN LOCATION</u>		
	The air horns shall be recess mounted in the front bumper fascia between the frame rails in the right and left outboard positions.		

175.	<u>AIR HORN RESERVOIR</u> One (1) air reservoir, with a 1200 cubic inch capacity, shall be installed on the chassis to act as a supply tank for operating air horns. The reservoir shall be isolated with a 90 PSI pressure protection valve on the reservoir supply side to prevent depletion of the air to the air brake system.		
176.	<u>ELECTRONIC SIREN SPEAKER</u> The two (2) electronic siren speakers shall be located on the front bumper face outboard of the frame rails with one (1) on the right side and one (1) on the left side in the outboard positions.		
177.	<u>FRONT BUMPER TOW EYES</u> The bumper shall include two (2) chrome plated tow eyes shall be installed through the front bumper. The eyes shall be fabricated from 0.75 inch thick #1020 ASTM-A36 hot rolled steel. The inside diameter of the eye shall be 2.00 inches and include a chamfered edge.		
178.	<u>CAB TILT SYSTEM</u>		
A	The entire cab shall be capable of tilting approximately 45-degrees to allow for easy maintenance of the engine and transmission. The cab tilt pump assembly shall be located on the right side of the chassis above the battery box.		
B	The electric-over-hydraulic lift system shall include an ignition interlock and red cab lock down indicator lamp on the tilt control which shall illuminate when holding the "Down" button to indicate safe road operation.		
C	It shall be necessary to activate the master battery switch and set the parking brake in order to tilt the cab. As a third precaution the ignition switch must be turned off to complete the cab tilt interlock safety circuit.		
D	Two (2) spring-loaded hydraulic hold down hooks located outboard of the frame shall be installed to hold the cab securely to the frame. Once the hold-down hooks are set in place, it shall take the application of pressure from the hydraulic cab tilt lift pump to release the hooks.		
E	Two (2) cab tilt cylinders shall be provided with velocity fuses in each cylinder port. The cab tilt pivots shall be 1.90 inch ball and be anchored to frame brackets with 1.25 inch diameter studs.		
F	A steel safety channel assembly, painted safety yellow shall be installed on the right side cab lift cylinder to prevent accidental cab lowering. The safety channel assembly shall fall over the lift cylinder when the cab is in the fully tilted position. A cable release system shall also be provided to retract the safety channel assembly from the lift cylinder to allow the lowering of the cab.		
179.	<u>CAB TILT AUXILIARY PUMP</u> A manual cab tilt pump module shall be attached to the cab tilt pump housing.		
180.	<u>CAB TILT CONTROL RECEPTACLE</u>		
A	The cab tilt control cable shall include a receptacle which shall be temporarily located on the right hand chassis rail rear of the cab to provide a place to plug in the cab tilt remote control pendant. The tilt pump shall include 8.00 feet of cable with a six (6) pin Deutsch receptacle with a cap.		
B	The remote control pendant shall include 20.00 feet of cable with a mating Deutsch connector. The remote control pendant shall be shipped loose with the chassis.		

181.	<u>CAB TILT NOISE DAMPENER</u> In an effort to reduce the amount of noise created by the cab tilt lock down system, sound dampening spray-on materials shall be utilized to insulate contact points in the system to help prevent metallic sounds from occurring while traversing rough roads.		
182.	<u>CAB TILT LOCK DOWN INDICATOR</u> The cab dash shall include a message located within the dual air pressure gauge which shall alert the driver when the cab is unlocked and ajar. The alert message shall cease to be displayed when the cab is in the fully lowered position and the hold down hooks are secured and locked to the cab mounts.		
A			
B	In addition to the alert message an audible alarm shall sound when the cab is unlocked and ajar and the parking brake is released.		
183.	<u>CAB WINDSHIELD</u>		
A	The cab windshield shall have a surface area of 2969.88 square inches and be of a two (2) piece wraparound design for maximum visibility.		
B	The glass utilized for the windshield shall include standard automotive tint. The left and right windshield shall be fully interchangeable thereby minimizing stocking and replacement costs.		
C	Each windshield shall be installed using black self-locking window rubber.		
184.	<u>GLASS FRONT DOOR</u>		
A	The front cab doors shall include a window which is 27.00 inches in width X 26.00 inches in height. These windows shall have the capability to roll down completely into the door housing. This shall be accomplished using electric actuation. The left and right front door windows shall be controlled using a switch on each respective side inner door panel. The driver's door shall include a switch for each powered door window in the cab. There shall be a master power switch at the driver's door to cut off power to the other cab windows.		
B	There shall be an irregular shaped fixed window which shall measure 2.50 inches wide at the top, 8.00 inches wide at the bottom X 26.00 inches in height, more commonly known as "cozy glass" ahead of the front door roll down windows.		
C	The windows shall be mounted within the frame of the front doors trimmed with a black anodized ring on the exterior.		
185.	<u>GLASS TINT FRONT DOOR</u> The windows located in the left and right front doors shall have a standard green automotive tint which shall allow seventy-five percent (75%) light transmittance.		
186.	<u>GLASS REAR DOOR RH</u> The rear right hand side crew door shall include a window which is 27.00 inches in width X 26.00 inches in height. The window shall be a powered type and shall be controlled by a switch on the inner door panel and on the driver's control panel.		
187.	<u>GLASS TINT REAR DOOR RIGHT HAND</u>		
	The window located in the right hand side rear door shall include a standard green automotive tint which shall allow seventy-five percent (75%) light transmittance.		
188.	<u>GLASS REAR DOOR LH</u>		
	The rear left hand side crew door shall include a window which is 27.00 inches in width X 26.00 inches in height. The window shall be a powered type and shall be controlled by a switch on the inner door panel and on the driver's control panel.		

189.	<u>GLASS TINT REAR DOOR LEFT HAND</u>		
	The window located in the left hand side rear door shall include a standard green automotive tint which shall allow seventy-five percent (75%) light transmittance.		
190.	<u>CLIMATE CONTROL</u>		
A	A ceiling mounted combination defroster and cabin heating and air conditioning system shall be located above the engine tunnel area. The system covers and plenums shall have sever duty design made of aluminum which shall be coated with a customer specified interior paint. The design of the system's covers shall provide quick access to washable air intake filters as well as easy access to other serviceable items.		
B	The air delivery plenums provide targeted airflow directly to the vehicle occupants. Six (6) adjustable louvers will provide comfort for the front seat occupants and ten (10) adjustable louvers will provide comfort for the rear crew occupants.		
C	The system shall be capable of producing up to 12 FPM of air velocity at all occupant seating positions. Separate front and rear blower motors shall be of brushless design and shall be controlled independently. It shall be capable of reducing the interior cabin air temperature from 122° F (+/- 3° F) to 80° F in thirty minutes with 50% relative humidity and full solar load as described in SAE J2646.		
D	The system shall also provide heater pull up performance which meets or exceeds the performance requirements of SAE J1612 as well as defrost performance that meets or exceeds the performance requirements of SAE J381.		
E	A gravity drain system shall be provided that is capable of evacuating condensate from the vehicle while on a slope of up to a 13% grade in any direction.		
F	The air conditioning system plumbing shall be a mixture of custom bent zinc coated steel fittings and Aero-quip GH134 flexible hose with Aeroquip EZ-Clip fittings.		
G	The overhead heater/defroster plumbing shall include an electronic flow control valve that re-directs hot coolant away from the evaporator, via a bypass loop, as the temperature control is moved toward the cold position.		
H	Any component which needs to be accessed to perform system troubleshooting shall be accessible by one person using basic hand tools. Regularly serviced items shall be replaceable by one person using basic hand tools.		
	<i>**Performance data is based on testing performed by an independent third party test facility using a medium four-door 10" Raised roof Gladiator chassis equipped with an ISL engine.</i>		
191.	<u>CLIMATE CONTROL DRAIN</u>		
	The climate control system shall include a gravity drain for water management. The gravity drain shall remove condensation from the air conditioning system without additional mechanical assistance.		
192.	<u>CLIMATE CONTROL ACTIVATION</u>		
	The heating, defrosting and air conditioning controls shall be located on the center dash panel in the lower left hand side, in a position which is easily accessible to the driver. The climate control shall be activated by a rotary switch.		
193.	<u>HVAC OVERHEAD COVER PAINT</u>		
	The overhead HVAC cover shall be painted with a multi-tone silver gray texture finish.		

194.	<u>AUXILIARY CLIMATE CONTROL FRONT UNDERSEAT</u>		
A	Two (2) 13,500 BTU heaters shall be provided and installed in the face of the seat riser storage area for the left and right front seats, one (1) each side. The fan controls shall be located on the Vista display and control screen(s).		
B	The auxiliary heater system hoses shall be silicone with stainless steel constant torque clamps approved for use with silicone hose. The auxiliary heater system shall include one (1) seasonal shut-off valve. The valve shall be supplied at the front of the right hand corner of the cab. The cab must be tilted to access the shut-off valve.		
195.	<u>AUXILIARY CLIMATE CONTROL REAR CREW</u>		
A	One (1) 53,500 BTU heater shall be provided and installed in the rear section of the crew cab under the center forward facing seat riser. The fan controls shall be located on the heater unit.		
B	The auxiliary heater system hoses shall be silicone with stainless steel constant torque clamps approved for use with silicone hose. The auxiliary heater system shall include one (1) seasonal shut-off valve. The valve shall be supplied at the front of the right hand corner of the cab. The cab must be tilted to access the shut-off valve.		
196.	<u>A/C CONDENSER LOCATION</u> A roof mounted A/C condenser shall be installed centered on the cab forward of the raised roof against the slope rise.		
197.	<u>A/C COMPRESSOR</u>		
	The air-conditioning compressor shall be a belt driven, engine mounted compressor. The compressor shall be compatible with R134-a refrigerant		
198.	<u>CAB CIRCULATION FANS FRONT</u> The cab shall include two (2) all metal 6.00 inch air circulation fans installed in the outer front cab corners. Each fan shall be controlled by an individual virtual button on the Vista display and control screen. The fans can be used to help defog the windshield or to increase air circulation for passenger comfort.		
199.	<u>UNDER CAB INSULATION</u>		
A	The underside of the cab tunnel surrounding the engine shall be lined with multi-layer insulation, engineered for application inside diesel engine compartments.		
B	The insulation shall act as a noise barrier, absorbing noise thus keeping the decibel level in the cab well within NFPA recommendations. As an additional benefit, the insulation shall assist in sustaining the desired temperature within the cab interior.		
C	The engine tunnel insulation shall measure approximately 0.75 inch thick including a vertically lapped polyester fiber layer, a 1.0 lb/ft ² PVC barrier layer, an open cell foam layer, and a moisture and heat reflective foil facing reinforced with a woven fiberglass layer. The foil surface acts as protection against moisture and other contaminants. The insulation shall meet or exceed FMVSS 302 flammability test.		
D	The insulation shall be cut precisely to fit each section and sealed for additional heat and sound deflection. The insulation shall be held in place by 3 mils of acrylic pressure sensitive adhesive and aluminum pins with hard hat, hold in place fastening heads.		

200.	<u>INTERIOR TRIM FLOOR</u>		
	The floor of the cab shall be covered with a multi-layer mat consisting of 0.25 inch thick sound absorbing closed cell foam with a 0.06 inch thick non-slip vinyl surface with a pebble grain finish. The covering shall be held in place by a pressure sensitive adhesive and aluminum trim molding. All exposed seams shall be sealed with silicone caulk matching the color of the floor mat to reduce the chance of moisture and debris retention.		
201.	<u>INTERIOR TRIM</u>		
	The cab interior shall include trim on the front ceiling, rear crew ceiling, and the cab walls. It shall be easily removable to assist in maintenance. The trim shall be constructed of insulated vinyl over a hard board backing.		
202.	<u>REAR WALL INTERIOR TRIM</u>		
	The rear wall of the cab shall be trimmed with vinyl.		
203.	<u>HEADER TRIM</u>		
	The cab interior shall feature header trim over the driver and officer dash constructed of 5052-H32 Marine Grade, 0.13 inch thick aluminum.		
204.	<u>TRIM CENTER DASH</u>		
	The main center dash area shall be constructed of 5052-H32 Marine Grade, 0.13 inch thick aluminum plate. There shall be four (4) holes located on the top of the dash near each outer edge of the electrical access cover for ventilation. The center dash electrical access cover shall include a gas cylinder stay which shall hold the cover open during maintenance.		
205.	<u>TRIM LH DASH</u>		
	The left hand dash shall be constructed of 5052-H32 Marine Grade, 0.13 inch thick aluminum plate for a perfect fit around the instrument panel. For increased occupant protection the extreme duty left hand dash utilizes patent pending break away technology to reduce rigidity in the event of a frontal crash. The left hand dash shall offer lower vertical surface area to the left and right of the steering column to accommodate control panels.		
206.	<u>TRIM RH DASH</u>		
	The right hand dash shall be constructed of 5052-H32 Marine Grade, 0.13 of an inch thick aluminum plate and shall include a glove compartment with a hinged door and a Mobile Data Terminal (MDT) provision. The glove compartment size will measure 14.00 inches wide X 6.38 inches high X 5.88 inches deep. The MDT provision shall be provided above the glove compartment.		
207.	<u>TRIM RH DASH ACCESSORIES</u>		
	The Mobile Data Terminal (MDT) provision on the right hand dash shall be provided with a locking slide-out tray that can lock in multiple positions. The MDT slide-out tray shall be constructed of 5052-H32 Marine Grade, 0.13 of an inch thick aluminum plate. The mounting surface of the tray measures 12.50 inches wide X 10.75 inches deep which shall allow for the mounting of a MDT with the added luxury of sliding it toward the officer as much as 11.00 inches.		
208.	<u>ENGINE TUNNEL TRIM</u>		
	The cab engine tunnel shall be covered with a multi-layer mat consisting of 0.25 inch closed cell foam with a 0.06 inch thick non-slip vinyl surface with a pebble grain finish. The mat shall be held in place by pressure sensitive adhesive. The engine tunnel mat shall be trimmed with anodized aluminum stair nosing trim for an aesthetically pleasing appearance.		
209.	<u>POWER POINT DASH MOUNT</u>		

	The cab shall include a 12 volt cigarette lighter type receptacle in the cab dash to provide a power source for 12 volt electrical equipment. The cab shall also include one (1) dual universal serial bus (USB) charging receptacle in the cab dash switch panel to provide a power source for USB chargeable electrical equipment. Each dual USB receptacle shall include two ports and shall be capable of up to a 5 Volt 2.1 amp output. Port 1 is optimized for fast charging at 1 amp. Port 2 is optimized for fast charging up to 2.1 amps, when used individually. The receptacles shall be wired battery direct.		
210.	<u>STEP TRIM</u>		
	Each cab entry door shall include a three step entry. The first step closest to the ground shall be constructed of polished 5032 H32 aluminum Grip Strut® grating with angled outer corners. The step shall feature a splash guard to reduce water and debris from splashing in to the step. The splash guard shall have an opening on the outer edge to allow debris and water to flow through rather than becoming trapped within the stepping surface. The lower step shall be mounted to a frame which is integral with the construction of the cab for rigidity and strength. The middle step shall be integral with the cab construction and shall be trimmed with a Flex-Tred® adhesive grit surface material.		
211.	<u>UNDER CAB ACCESS DOOR</u>		
	The cab shall include an aluminum access door in the left crew step riser painted to match the cab interior paint with a push and turn latch. The under cab access door shall provide access to the diesel exhaust fluid fill.		
212.	<u>INTERIOR DOOR TRIM</u>		
	The interior trim on the doors of the cab shall consist of an aluminum panel constructed of Marine Grade 5052-H32 0.13 of an inch thick aluminum plate. The door panels shall include a painted finish.		
213.	<u>DOOR TRIM CUSTOMER NAMEPLATE</u>		
	The interior door trim on the front doors shall include a customer nameplate which states the vehicle was custom built for their Department.		
214.	<u>CAB DOOR TRIM REFLECTIVE</u>		
	The interior of each door shall include high visibility reflective tape. A white reflective tape shall be provided vertically along the outer rear edge of the door. The lowest portion of each door skin shall include a reflective tape chevron with red and white stripes. The chevron tape shall measure 6.00 inches in height.		
215.	<u>INTERIOR GRAB HANDLE "A" PILLAR</u>		
	There shall be two (2) rubber covered 11.00 inch grab handles installed inside the cab, one on each "A" post at the left and right door openings. The left handle shall be located 7.88 inches above the bottom of the door window opening and the right handle shall be located 2.88 inches above the bottom of the door window opening. The handles shall assist personnel in entering and exiting the cab.		
216.	<u>INTERIOR GRAB HANDLE FRONT DOOR</u>		
	Each front door shall include one (1) ergonomically contoured 9.00 inch cast aluminum handle mounted horizontally on the interior door panels. The handles shall feature a textured black powder coat finish to assist personnel entering and exiting the cab.		
217.	<u>INTERIOR GRAB HANDLE REAR DOOR</u>		
	A black powder coated cast aluminum assist handle shall be provided on the inside of each rear crew door. A 30.00 inch long handle shall extend horizontally the width of the window just above the window sill. The handle shall assist personnel in exiting and entering the cab.		
218.	<u>INTERIOR SOFT TRIM COLOR</u>		
	The cab interior soft trim surfaces shall be gray in color.		

219.	<u>INTERIOR TRIM SUNVISOR</u>		
	The header shall include two (2) sun visors, one each side forward of the driver and officer seating positions above the windshield. Each sun visor shall be constructed of Masonite and covered with padded vinyl trim.		
220.	<u>INTERIOR FLOOR MAT COLOR</u>		
	The cab interior floor mat shall be gray in color.		
221.	<u>CAB PAINT INTERIOR</u>		
	The inner door panel surfaces shall feature a medium gray Spar-Liner spray on bed liner coating.		
222.	<u>HEADER TRIM INTERIOR PAINT</u>		
	The metal surfaces in the header area shall feature a medium gray Spar-Liner spray on bed liner coating.		
223.	<u>TRIM CENTER DASH INTERIOR PAINT</u>		
A	The entire center dash and any accessory pods attached to the dash shall feature a medium gray Spar-Liner spray on bed liner coating.		
224.	<u>TRIM LEFT HAND DASH INTERIOR PAINT</u>		
	The left hand dash shall feature a medium gray Spar-Liner spray on bed liner coating.		
225.	<u>TRIM RIGHT HAND DASH INTERIOR PAINT</u>		
	The right hand dash shall feature a medium gray Spar-Liner spray on bedliner coating.		
226.	<u>RIGHT HAND DASH ACCESSORIES INTERIOR PAINT</u>		
	The right hand dash accessories shall be coated with black powder coat.		
227.	<u>DASH PANEL GROUP</u>		
	The main center dash area shall include three (3) removable panel located one (1) to the right of the driver position, one (1) in the center of the dash and one (1) to the left of the officer position. The center panel shall be within comfortable reach of both the driver and officer.		
228.	<u>SWITCHES CENTER PANEL</u>		
A	The center dash panel shall include six (6) switch positions in the upper left portion of the panel.		
B	A rocker switch with a blank legend installed directly above shall be provided for any position without a switch and legend designated by a specific option. The non-specified switches shall be two-position, black switches with a green indicator light. Each blank switch legend can be custom engraved by the body manufacturer. All switch legends shall have backlighting provided.		
229.	<u>SWITCHES LEFT PANEL</u>		
	The left dash panel shall include one (1) windshield wiper/washer control switch located in the left hand side of the panel. The switch shall have backlighting provided.		
230.	<u>SWITCHES RIGHT PANEL</u>		
	The right dash panel shall include no rocker switches or legends.		

231.	<u>SEAT BELT WARNING</u>		
A	A Weldon seat belt warning system, integrated with the Vehicle Data Recorder system, shall be installed for each seat within the cab. The system shall provide a visual warning indicator in the Vista display and control screen(s), an indicator light in the instrument panel, and an audible alarm.		
B	The warning system shall activate when any seat is occupied with a minimum of 60 pounds, the corresponding seat belt remains unfastened, and the park brake is released. The warning system shall also activate when any seat is occupied, the corresponding seat belt was fastened in an incorrect sequence, and the park brake is released. Once activated, the visual indicators and audible alarm shall remain active until all occupied seats have the seat belts fastened.		
232.	<u>SEAT MATERIAL</u>		
	The seats shall be covered with Turnout Tuff™ rugged material. Turnout Tuff material is rip-stop weave nylon laminated with a polyurethane backing and is water repellent to 75 PSI to protect seats from being saturated or contaminated by fluids. The material meets FMVSS 302 flammability requirements.		
233.	<u>SEAT COLOR</u>		
	All seats supplied with the chassis shall be gray in color. All seats shall include red seat belts		
234.	<u>SEAT DRIVER</u>		
A	The driver's seat shall be a Seats Inc. 911 Battalion series. The four-way seat shall be self-leveling and feature a 3.00 inches vertical travel air suspension and manual fore and aft adjustment. The suspension control shall be located on the seat below the cushion. The seat shall also feature integral springs to isolate shock.		
B	The seat shall feature an all belts to seat (ABTS) style of safety restraint. The ABTS feature shall include a three-point shoulder harness with the lap belt and automatic retractor as an integral part of the seat assembly. The buckle portion of the seat belt shall extend from the seat base towards the driver position within easy reach of the occupant.		
C	The minimum vertical dimension from the seat H-point to the ceiling for this belted seating position shall be 37.00 inches measured with the seat suspension height adjusted to the upper limit of its travel.		
D	This model of seat shall have successfully completed the static load tests set forth by FMVSS 207/210. This testing shall include a simultaneous forward load of 3000 pounds each on the lap and shoulder belts and twenty (20) times the weight through the center of gravity. This model of seat installed in the cab model, as specified, shall have successfully completed the dynamic sled testing using FMVSS 208 as a guide with the following accommodations. In order to reflect the larger size outfitted firefighters, the test dummy used shall be a 95th percentile hybrid III male weighing 225 pounds rather than the 50th percentile male dummy weighing 165 pounds as referenced in FMVSS 208.		
E	The materials used in construction of the seat shall also have successfully completed testing with regard to the flammability of materials used in the occupant compartments of motor vehicles as outlined in FMVSS 302, of which dictates the allowable burning rate of materials in the occupant compartments of motor vehicles.		

235.	<u>SEAT BACK DRIVER</u>		
	The driver's seat shall include a standard seat back incorporating the all belts to seat feature (ABTS). The seat back shall feature a contoured head rest.		
236.	<u>SEAT MOUNTING DRIVER</u>		
	The driver's seat shall be installed in an ergonomic position in relation to the cab dash.		
237.	<u>OCCUPANT PROTECTION DRIVER</u>		
A	The driver's position shall be equipped with the Advanced Protection System™ (APS). The APS shall selectively deploy integrated systems to protect against injuries in qualifying frontal impact, side impact, and rollover events. The increase in survivable space and security of the APS shall also provide ejection mitigation protection.		
B	The driver's seating area APS shall include:		
	<ul style="list-style-type: none"> Advanced seat belt system - retractor pre-tensioner tightens the seat belt around the driver, securing the occupant in the seat and the load limiter plays out some of the seat belt webbing to reduce seat belt to chest and torso force upon impact as well as mitigate head and neck injuries. 		
	<ul style="list-style-type: none"> Large side curtain airbag - protects the driver's head, neck, and upper body from dangerous cab side surfaces and contact points with intrusive surfaces as a result of a collision as well as provides ejection mitigation protection to the driver in a qualifying event by covering the window and the upper portion of the door. 		
	<ul style="list-style-type: none"> Dual knee airbags (patent pending) with energy management mounting (patent pending) - protects the driver's lower body from dangerous surface contact injuries, acceleration injuries, and from intrusion as well as locks the lower body in place so the upper body shall be slowed by the load limiting seat belt. 		
C	Steering wheel airbag - protects the driver's head, neck, and upper torso from contact injuries, acceleration injuries, and contact points with intrusive surfaces as a result of a collision.		
238.	<u>SEAT OFFICER</u>		
A	The 2.5" discharge outlets located on the left side pump panel shall be furnished with a 2.5" (F) National Standard hose thread x 2.5" (M) National Standard hose thread, chrome plated, 45 degree elbow. The officer's seat shall be a Seats Inc. 911 ABTS Battalion series. The seat shall feature a tapered and padded seat, and cushion. The seat shall be a non-adjustable type seat.		
B	The seat shall feature an all belts to seat (ABTS) style of safety restraint. The ABTS feature shall include a three-point shoulder harness with the lap belt and automatic retractor as an integral part of the seat assembly. The buckle portion of the seat belt shall extend from the seat base towards the driver position within easy reach of the occupant.		
C	The minimum vertical dimension from the seat H-point to the ceiling for this belted seating position shall be 35.00 inches.		
D	This model of seat shall have successfully completed the static load tests by FMVSS 207/210. This testing shall include a simultaneous forward load of 3000 pounds each on the lap and shoulder belts and twenty (20) times the weight through the center of gravity. This model of seat installed in the cab model, as specified, shall have successfully completed the dynamic sled testing using FMVSS 208 as a guide with the following accommodations. In order to reflect the larger size outfitted firefighters, the test dummy used shall be a 95th percentile hybrid III male weighing 225 pounds rather than the 50th percentile male dummy weighing 165 pounds as referenced in FMVSS 208. The model of seats shall also have successfully completed the flammability of materials used in the occupant compartments of motor vehicles as outlined in FMVSS 302, of which decides the burning rate of materials in the occupant compartments of motor vehicles.		

239.	<u>SEAT BACK OFFICER</u>		
	The officer's seat shall include a standard seat back incorporating the all belts to seat feature (ABTS). The seat back shall feature a contoured head rest.		
240.	<u>SEAT MOUNTING OFFICER</u>		
	The officer's seat shall be installed in an ergonomic position in relation to the cab dash.		
241.	<u>OCCUPANT PROTECTION OFFICER</u>		
A	The officer's position shall be equipped with the Advanced Protection System™ (APS). The APS shall selectively deploy integrated systems to protect against injuries in qualifying frontal impact, side impact, and rollover events. The increase in survivable space and security of the APS shall also provide ejection mitigation protection.		
B	The officer's seating area APS shall include:		
	<ul style="list-style-type: none"> Advanced seat belt system - retractor pre-tensioner tightens the seat belt around the officer, securing the occupant in the seat and the load limiter plays out some of the seat belt webbing to reduce seat belt to chest and torso force upon impact as well as mitigate head and neck injuries. 		
	<ul style="list-style-type: none"> Large side curtain airbag - protects the officer's head, neck, and upper body from dangerous cab side surfaces and contact points with intrusive surfaces as a result of a collision as well as provides ejection mitigation protection to the officer in a qualifying event by covering the window and the upper portion of the door. 		
B	Knee airbags - protects the officer's lower body from dangerous surface contact injuries, acceleration injuries, and from contact points with intrusive surfaces as a result of a collision as well as locks the lower body in place so the upper body shall be slowed by the load limiting seat belt.		
242.	<u>SEAT BELT ORIENTATION CREW</u>		
	The crew position seat belts shall follow the standard orientation which extends from the outboard shoulder extending to the inboard hip.		
243.	<u>SEAT FORWARD FACING OUTER LOCATION</u>		
	The crew area shall include two (2) forward facing outboard seats, which include one (1) located next to the outer wall of the cab on the left side of the cab and one (1) located next to the outer wall on the right side of the cab.		
244.	<u>SEAT CREW FORWARD FACING OUTER</u>		
A	The crew area shall include a seat in the forward facing outer position which shall be a theatre style series. The seat shall feature a padded seat cushion which shall be hinged and attached to the wall providing optimum space savings. The seat shall remain in the stored position until occupied.		
B	The minimum vertical dimension from the seat H-point to the ceiling for each belted seating position shall be 35.00 inches.		
C	This model of seat shall have successfully completed the static load tests by FMVSS 207/210. This testing shall include a simultaneous forward load of 3000 pounds each on the lap and shoulder belts and twenty (20) times the weight through the center of gravity. This model of seat installed in the cab model, as specified, shall have successfully completed the dynamic sled testing using FMVSS 208 as a guide with the following accommodations. In order to reflect the larger size outfitted firefighters, the test dummy used shall be a 95th percentile hybrid III male weighing 225 pounds rather than the 50th percentile male dummy weighing 165 pounds as referenced in FMVSS 208. The model of seats shall also have successfully completed the flammability of materials used in the occupant compartments of motor vehicles as outlined in FMVSS 302, of which decides the burning rate of materials in the occupant compartments of motor vehicles.		

245.	<u>SEAT BACK FORWARD FACING OUTER</u>		
A	The crew area shall include a seat in the forward facing outer position which shall be a theatre style seat. The rear wall padded trim shall act as the backrest for each seat.		
B	There shall be a red, three-point shoulder harness with lap belt and an automatic retractor attached to the cab and available to the seat. The buckle portion of the seat belt shall be mounted on a rigid or semi-rigid stalk such that the buckle remains positioned in an accessible location. The seat belt assembly anchorages shall conform to the Federal Safety Standard (FMVSS) No. 210, "Seat belt assembly anchorages".		
246.	<u>SEAT MOUNTING FORWARD FACING OUTER</u>		
	The forward facing outer seat shall be mounted in the furthest outboard position facing the front of the cab.		
247.	<u>OCCUPANT PROTECTION FFO</u>		
A	The forward facing outer seat position(s) shall be equipped with the Advanced Protection System™ (APS). The APS shall selectively deploy integrated systems to protect against injuries in qualifying frontal impact, side impact, and rollover events. The increase in survivable space and security of the APS shall also provide ejection mitigation protection.		
B	Each forward facing outer seating position APS shall include:		
	<ul style="list-style-type: none"> • APS advanced seatbelt system - retractor pre-tensioners tighten the seat belts around each occupant, securing the occupants in seats and load limiters play out some of the seat belt webbing to reduce seat belt to chest and torso force upon impact as well as mitigate head and neck injuries. 		
C	Side curtain airbag - protects each occupant's head, neck, and upper body from dangerous cab side surfaces and contact points with intrusive surfaces as a result of a collision as well as provides ejection mitigation protection to each occupant in a qualifying event by covering the windows and walls adjacent to each seating position with an airbag custom designed for each cab configuration.		
248.	<u>SEAT FORWARD FACING CENTER LOCATION</u>		
	The crew area shall include two (2) forward facing center crew seats with both located at the center of the rear wall.		
249.	<u>SEAT CREW FORWARD FACING CENTER</u>		
A	The crew area shall include a seat in the forward facing center position which shall be a Seats Inc. 911 Battalion series. The seat shall feature a tapered and padded seat, and cushion. The seat and cushion shall be hinged and compact in design for additional room and shall remain in the stored position until occupied.		
B	The seat shall feature an all belts to seat (ABTS) style of safety restraint. The ABTS feature shall include a three-point shoulder harness with the lap belt and automatic retractor as an integral part of the seat assembly. The buckle portion of the seat belt shall extend from the seat base towards the driver position within easy reach of the occupant.		
C	The minimum vertical dimension from the seat H-point to the ceiling for each belted seating position shall be 35.00 inches.		

D	This model of seat shall have successfully completed the static load tests by FMVSS 207/210. This testing shall include a simultaneous forward load of 3000 pounds each on the lap and shoulder belts and twenty (20) times the weight through the center of gravity. This model of seat installed in the cab model, as specified, shall have successfully completed the dynamic sled testing using FMVSS 208 as a guide with the following accommodations. In order to reflect the larger size outfitted firefighters, the test dummy used shall be a 95th percentile hybrid III male weighing 225 pounds rather than the 50th percentile male dummy weighing 165 pounds as referenced in FMVSS 208. The model of seats shall also have successfully completed the flammability of materials used in the occupant compartments of motor vehicles as outlined in FMVSS 302, of which decides the burning rate of materials in the occupant compartments of motor vehicles.		
250.	<u>SEAT BACK FORWARD FACING CENTER</u>		
A	The crew area shall include a seat back in the forward facing center position which shall include a Ziamatic brand Load and Lock™ walk away self-contained breathing apparatus (SCBA) bracket. The mechanical walk away bracket shall meet NFPA 1901-03 9G dynamic requirements for cylinder restraint systems for use in crew compartments of fire truck cabs. The bracket shall consist of a back plate and a short back plate, both of which shall be thermoplastic coated for trouble free service. The bracket shall feature two (2) high cycle double coated clips which shall not mar the cylinders.		
B	The bracket shall accommodate and secure all types of self-contained breathing apparatus cylinders. Each bracket shall include a model LLS strap assembly which shall meet the NFPA 1901-03 standard for SCBA retention and shall be easily adjustable.		
C	The seat back shall include a removable padded cover which shall be provided over the SCBA cavity.		
251.	<u>OCCUPANT PROTECTION FFC</u>		
A	The forward facing center seat position(s) shall be equipped with the Advanced Protection System™ (APS). The APS shall selectively deploy integrated systems to protect against injuries in qualifying frontal impact, side impact, and rollover events. The increase in survivable space and security of the APS shall also provide ejection mitigation protection.		
B	Each forward facing center seating position APS shall include:		
	<ul style="list-style-type: none"> • APS advanced seatbelt system - retractor pre-tensioners tighten the seat belts around each occupant, securing the occupants in seats and load limiters play out some of the seat belt webbing to reduce seat belt to chest and torso force upon impact as well as mitigate head and neck injuries. 		
C	Side curtain airbag - provides ejection mitigation protection to each occupant in a qualifying event by covering the windows and walls adjacent to crew seating with an airbag custom designed for each cab configuration.		
252.	<u>SEAT FRAME FORWARD FACING</u>		
	The forward facing center seating positions shall include an enclosed seat frame located and installed on the rear wall. The seat frame shall measure 42.38 inches wide X 12.38 inches high X 22.00 inches deep. The seat frame shall be constructed of Marine Grade 5052-H32 0.19 inch thick aluminum plate. The seat box shall be painted with the same color as the remaining interior.		
253.	<u>SEAT FRAME FORWARD FACING STORAGE ACCESS</u>		
	The seat frame shall include a forward facing vent which shall allow air to flow through from the under seat climate control unit.		

254.	<u>SEAT MOUNTING FORWARD FACING CENTER</u>		
	The forward facing center seats shall be installed facing the front of the cab.		
255.	<u>CAB FRONT UNDERSEAT STORAGE ACCESS</u>		
	The left and right under seat storage areas shall have a removable vented aluminum cover.		
256.	<u>SEAT COMPARTMENT DOOR FINISH</u>		
	All under seat storage compartment access doors shall feature a medium gray Spar-Liner spray on bed liner coating.		
257.	<u>WINDSHIELD WIPER SYSTEM</u>		
	The cab shall include a dual arm wiper system which shall clear the windshield of water, ice and debris. There shall be two (2) windshield wipers which shall be affixed to a radial wet arm. The system shall include a single motor which shall initiate the arm in which both the left hand and right hand windshield wipers are attached, initiating a back and forth motion for each wiper. The wiper motor shall be activated by an intermittent wiper control located within easy reach of the driver's position.		
258.	<u>ELECTRONIC WINDSHIELD FLUID LEVEL INDICATOR</u>		
	The windshield washer fluid level shall be monitored electronically. When the washer fluid level becomes low the yellow "Check Message Center" indicator light on the instrument panel shall illuminate and the message center in the dual air pressure gauge shall display a "Check Washer Fluid Level" message.		
259.	<u>CAB DOOR HARDWARE</u>		
A	The cab entry doors shall be equipped with exterior pull handles, suitable for use while wearing firefighter gloves. The handles shall be made of aluminum with a chrome plated finish.		
B	The interior exit door handles shall be flush paddle type with a black finish, which are incorporated into the upper door panel.		
C	All cab entry doors shall include locks which are keyed alike. The door locks shall be designed to prevent accidental lockout.		
D	The exterior pull handles shall include a scuff plate behind the handle constructed of polished stainless steel to help protect the cab finish.		
260.	<u>DOOR LOCKS</u>		
	Each cab entry door shall include a manually operated door lock. Each door lock may be actuated from the inside of the cab by means of a red knob located on the paddle handle of the respective door or by using a TriMark key from the exterior. The door locks are designed to prevent accidental lock out.		
261.	<u>GRAB HANDLES</u>		
	The cab shall include one (1) 18.00 inch knurled, anti-slip, one-piece exterior assist handle behind each cab door. The assist handle shall be made of SAE 304 stainless steel and be 1.25 inch diameter to enable easy grabbing with the gloved hand. Each assist handle shall include a stainless steel plate which saves the cab from scuffs through continued use of the handle.		
262.	<u>REARVIEW MIRRORS</u>		
A	Velvac West Coast style mirrors model 708211 shall be provided and installed on the driver's and officer's doors. The mirrors shall be mounted to the cab doors with tubular stainless steel swing away arms and the mirror heads shall be center mounted on the arms to provide rigid mounting to reduce vibration.		

B	The mirror heads shall measure 8.00 inches wide X 16.00 inches high. The flat mirrors shall be heated and remote controlled with horizontal actuation. The mirror control switches shall be located within easy reach of the driver. Manually adjustable convex mirrors which are 6.50 inches wide x 6.00 inches high shall be provided below the flat mirrors.		
263.	<u>REARVIEW MIRROR HEAT SWITCH</u>		
	The heat for the rearview mirrors shall be controlled through a virtual button on the Vista display and control screen.		
264.	<u>TRIM LOWER SIDE</u>		
	A stainless steel trim band, 10.00 inches high, with upper and lower black and chrome trim moldings, shall be installed on the lower exterior sides of the cab and doors. The trim shall be installed so that the top edge approximately 1.00 inch below the top of the front bumper, and shall be affixed without holes and fasteners.		
265.	<u>TRIM LOWER SIDE FRONT</u>		
	A stainless steel trim band, 10.00 inches high, with upper and lower black and chrome trim moldings, shall be installed on the lower exterior sides of the cab between the front bumper and the front doors. The trim shall be installed so that the top edge is approximately 1.00 inch below the top of the front bumper, and shall be affixed without holes and fasteners.		
266.	<u>EXTERIOR TRIM REAR CORNER</u>		
	There shall be mirror finish stainless steel scuff plates on the outside corners at the back of the cab. The stainless steel plate shall be affixed to the cab using two sided adhesive tape.		
267.	<u>CAB FENDER</u>		
	Full width wheel well liners shall be installed on the extruded cab to limit road splash and enable easier cleaning. Each two-piece liner shall consist of an inner liner 16.00 inches wide made of vacuum formed ABS composite and an outer fenderette 3.50 inches wide made of SAE 304 polished stainless steel.		
268.	<u>MUD FLAPS FRONT</u>		
	The front wheel wells shall have mud flaps installed on them.		
269.	<u>IGNITION</u>		
A	A master battery system with a keyless start ignition system shall be provided. Each system shall be controlled by a one-quarter turn Cole Hersee switch, both of which shall be mounted to the left of the steering wheel on the dash. A chrome push type starter button shall be provided adjacent to the master battery and ignition switches.		
B	Each switch shall illuminate a green LED indicator light on the dash when the respective switch is placed in the "ON" position.		
C	The starter button shall only operate when both the master battery and ignition switches are in the "ON" position.		
270.	<u>BATTERY</u>		
	The single start electrical system shall include six (6) Harris BCI 31 925 CCA batteries with a 210 minute reserve capacity and 4/0 welding type dual path starter cables per SAE J541.		
271.	<u>BATTERY TRAY</u>		
A	The batteries shall be installed within two (2) steel battery trays located on the left side and right side of the chassis, securely bolted to the frame rails. The battery trays shall be coated with the same material as the frame.		

B	The battery trays shall include drain holes in the bottom for sufficient drainage of water. A durable, non-conducting, interlocking mat made by Dri-Dek shall be installed in the bottom of the trays to allow for air flow and help prevent moisture build up. The batteries shall be held in place by non-conducting phenolic resin hold down boards.		
272.	<u>BATTERY BOX COVER</u>		
	Each battery box shall include a steel cover which protects the top of the batteries. Each cover shall include flush latches which shall keep the cover secure as well as a black powder coated handle for convenience when opening.		
273.	<u>BATTERY CABLE</u>		
	The starting system shall include cables which shall be protected by 275 degree F. minimum high temperature flame retardant loom, sealed at the ends with heat shrink and sealant.		
274.	<u>BATTERY JUMPER STUD</u>		
	The starting system shall include battery jumper studs. These studs shall be located in the forward most portion of the driver's side lower step. The studs shall allow the vehicle to be jump started, charged, or the cab to be raised in an emergency in the event of battery failure.		
275.	<u>ALTERNATOR</u>		
	The charging system shall include a 270 amp Leece Neville 12 volt alternator. The alternator shall include a self-excited integral regulator.		
276.	<u>STARTER MOTOR</u>		
	The single start electrical system shall include a Delco brand starter motor.		
277.	<u>BATTERY CONDITIONER</u>		
	A Kussmaul Auto Charge 40 LPC battery conditioner shall be supplied. The battery conditioner shall provide a 40 amp output for the chassis batteries and a 15 amp output circuit for accessory loads. The battery conditioner shall be mounted in the cab on top of the left hand mid EMS compartment. The battery conditioner shall include an additional 6.00 feet of coiled wire for relocation by the body manufacturer.		
278.	<u>BATTERY CONDITIONER DISPLAY</u>		
	A Kussmaul battery conditioner display shall be supplied. The battery conditioner display shall be mounted to the dash so it is viewable through the front windshield on the left hand side of the cab.		
279.	<u>AUXILIARY AIR COMPRESSOR</u>		
	A Kussmaul Auto Pump 120V air compressor shall be supplied. The air compressor shall be installed on top of the left hand side EMS compartment. The air compressor shall be plumbed to the air brake system to maintain air pressure.		
280.	<u>ELECTRICAL INLET</u>		
A	A Kussmaul 20 amp super auto-eject electrical receptacle shall be supplied. It shall automatically eject the plug when the starter button is depressed.		
B	A single item or an addition of multiple items must not exceed the rating of the electric inlet that it's connected to.		

C	<p><u>Amp Draw Reference List:</u> <i>Kussmaul 1000 Charger - 3.5 Amps</i> <i>Kussmaul 1200 Charger - 10 Amps</i> <i>Kussmaul 35/10 Charger - 10 Amps</i> <i>1000W Engine Heater - 8.33 Amps</i> <i>1500W Engine Heater - 12.5 Amps</i> <i>120V Air Compressor - 4.2 Amps</i></p>		
281.	<u>ELECTRICAL INLET LOCATION</u>		
	An electrical inlet shall be installed on the left hand side of cab over the wheel well.		
282.	<u>ELECTRICAL INLET CONNECTION</u>		
	The electrical inlet shall be connected to the battery conditioner and the air pump.		
283.	<u>ELECTRICAL INLET COLOR</u>		
	The electrical inlet connection shall include a yellow cover.		
284.	<u>CAB/CHASSIS ELECTRICAL OUTLET</u>		
	There shall be a 120V 20A power pre-wired into the cab to a junction box behind the driver's seat. 12/3 wiring terminating in the junction box shall be routed to behind the cab on the chassis frame rails with a 15.00 feet long coil for connection to apparatus 120V power supply.		
285.	<u>HEADLIGHTS</u>		
	The cab front shall include four (4) rectangular LED headlamps with separate high and low beams mounted in bright chrome bezels.		
286.	<u>FRONT TURN SIGNALS</u>		
	The front fascia shall include two (2) Whelen model 600 4.00 inch X 6.00 inch programmable amber LED turn signals shall be installed in a chrome bezel outboard of the front warning and above the headlamps installed in the outboard position.		
287.	<u>HEADLIGHT LOCATION</u>		
	The headlights shall be located on the front fascia of the cab directly below the front warning lights.		
288.	<u>SIDE TURN/MARKER LIGHTS</u>		
	The sides of the cab shall include two (2) LED round side marker lights which shall be provided just behind the front cab radius corners.		
289.	<u>MARKER AND ICC LIGHTS</u>		
	In accordance with FMVSS, there shall be five (5) LED cab marker lamps designating identification, center and clearance provided. These lights shall be installed on the face of the cab within full view of other vehicles from ground level.		
290.	<u>HEADLIGHT AND MARKER LIGHT ACTIVATION</u>		
	The headlights and marker lights shall be controlled via a virtual button on the Vista display. There shall be a virtual dimmer control on the Vista display to adjust the brightness of the dash lights. The headlamps shall be equipped with the "Daytime Running" light feature, which shall illuminate the headlights to 80% brilliance when the battery master switch is in the "On" position and the parking brake is released.		

291.	<u>GROUND LIGHTS</u>		
	Each door shall include an NFPA compliant LED ground light mounted to the underside of the cab step below each door. The lights shall include a polycarbonate lens, a housing which is vibration welded and LEDs which shall be shock mounted for extended life. The ground lighting shall be activated by the opening of the door on the respective cab side, when the parking brake is set and through a virtual button on the Vista display and control screen.		
292.	<u>LOWER CAB STEP LIGHTS</u>		
	The middle step located at each door shall include a recess mounted 4.00 inch round LED light which shall activate with the opening of the respective door.		
293.	<u>INTERMEDIATE STEP LIGHTS</u>		
	The intermediate step well area at each door shall include an LED light within a chrome housing. The Egress step lights shall provide visibility to the step well area for the first step exiting the vehicle. The Egress step lights shall activate with Entry step lighting.		
294.	<u>ENGINE COMPARTMENT LIGHT</u>		
	There shall be an LED NFPA compliant light mounted under the engine tunnel for area work lighting on the engine. The light shall include a polycarbonate lens, a housing which is vibration welded and a bulb which shall be shock mounted for extended life. The light shall activate automatically when the cab is tilted.		
295.	<u>FRONT SCENE LIGHTS</u>		
A	The front of the cab shall include a Whelen Dual Panel Pioneer Plus contour roof mount flood light installed on the brow of the cab.		
B	Each lamp head shall have two (2) 12 volt high intensity LED panels. Each lamp head shall draw 1.2 amps and generate 15,000 lumens total. Each lamp head will be adjustable up to 20-degrees and shall measure 4.25 inches in height X 14.00 inches in width. Each lamp head and bracket shall be powder coated white.		
296.	<u>FRONT SCENE LIGHTS ACTIVATION</u>		
	The front scene lighting shall be pre-wired to be activated by the OEM. A legend shall be included on the switch panel in a customer specified location that shall read "Brow Lights".		
297.	<u>FRONT SCENE LIGHT LOCATION</u>		
	There shall be one (1) scene light mounted center on the front brow of the cab.		
298.	<u>SIDE SCENE LIGHTS</u>		
A	The cab shall include two (2) Whelen Pioneer model PCPSM2C LED surface mount lights installed one (1) on each side of the cab.		
B	The PCPSM2C configuration shall consist of 24 white Super-LEDs for the spot light with a specialized spot reflector on the bottom, 48 white Super-LEDs in the flood light with a clear optic collimator/metalized reflector assembly on the top, and a clear non-optic polycarbonate lens. The Pioneer flood/spot light shall draw 12.0 amps and generate 16,000 usable lumens. The PCPSM2C projects light directly down at 5-degree and producing illumination to the side of the vehicle arching upward to a 90-degree pattern of light. Each lamp head shall measure 6.37 inches in height X 16.22 inches in width and shall be chrome plated.		
299.	<u>SIDE SCENE LIGHT LOCATION</u>		
	The scene lighting located on the left and right sides of the cab shall be mounted rearward of the cab "B" pillar in the 10.00 inch raised roof portion of the cab between the front and rear crew doors.		

300.	<u>SIDE SCENE ACTIVATION</u>		
	The scene lights shall be activated by two (2) virtual buttons on the Vista display and control screen(s), one (1) for each light.		
301.	<u>INTERIOR OVERHEAD LIGHTS</u>		
A	The cab shall include a two-section, red and clear Weldon LED dome lamp located over each door. The dome lamps shall be rectangular in shape and shall measure approximately 7.00 inches in length X 3.00 inches in width with a black colored bezel. The clear portion of each lamp shall be activated by opening the respective door and via the multiplex display and both the red and clear portion can be activated by individual push lenses on each lamp.		
B	An additional incandescent three (3) light module with dual map lights shall be located over the engine tunnel which can be activated by individual switches on the lamp.		
302.	<u>AUXILIARY DOME LIGHT REAR CREW</u>		
	The cab shall include two (2) 7.00 inch auxiliary dome lights on the headliner inboard of the outer forward facing crew seats. The lights shall include red lenses. These lights shall be activated by an individual switch located on the side of each light.		
303.	<u>MAP LIGHTS</u>		
	A Roxter gooseneck style map light shall be provided. The light shall have a clear bulb and a control switch on the base. The light shall be located on the right hand side of the dash.		
304.	<u>SPOTLIGHT</u>		
	The officer position shall include one (1) 12 volt Optronics KB-4003 hand-held spotlight which shall be mounted to the right of the engine tunnel top surface. The spotlight shall provide 400,000 candlepower of illumination and shall include a 10.00 foot coil cord and a momentary push button switch.		
305.	<u>DO NOT MOVE APPARATUS LIGHT</u>		
A	The front headliner of the cab shall include a flashing red Whelen Ion LED light clearly labeled "Do Not Move Apparatus". In addition to the flashing red light, an audible alarm shall be programmed into the multiplex system which shall sound while the light is activated.		
B	The flashing red light shall be located centered left to right for greatest visibility.		
C	The light and alarm shall be interlocked for activation when either a cab door is not firmly closed or an apparatus compartment door is not closed, and the parking brake is released.		
306.	<u>MASTER WARNING SWITCH</u>		
A	A master switch shall be included, as a virtual button on the Vista display and control screen which shall be labeled "E Master" for identification. The button shall feature control over all devices wired through it. Any warning device switches left in the "ON" position when the master switch is activated shall automatically power up.		
307.	<u>HEADLIGHT FLASHER</u>		
A	An alternating high beam headlight flashing system shall be installed into the high beam headlight circuit which shall allow the high beams to flash alternately from left to right.		
B	Deliberate operator selection of high beams will override the flashing function until low beams are again selected. Per NFPA, these clear flashing lights will also be disabled "On Scene" when the park brake is applied.		
308.	<u>HEADLIGHT FLASHER SWITCH</u>		
	The flashing headlights shall be activated through a virtual button on the Vista display and control screen.		

309.	<u>INBOARD FRONT WARNING LIGHTS</u>		
	The cab front fascia shall include two (2) Whelen M6 Super LED front warning lights in the left and right inboard positions. The lights shall feature multiple flash patterns including steady burn for solid colors and multiple flash patterns for split colors. The lights shall be mounted to the front fascia of the cab within a chrome bezel		
310.	<u>INBOARD FRONT WARNING LIGHTS COLOR</u>		
	The warning lights mounted on the cab front fascia in the inboard positions shall be red.		
311.	<u>FRONT WARNING SWITCH</u>		
	The front warning lights shall be controlled through a virtual control on the Vista display and control screen. This switch shall be clearly labeled for identification.		
312.	<u>INTERSECTION WARNING LIGHTS</u>		
	The chassis shall include two (2) Whelen M6 series Super LED intersection warning lights, one (1) each side. The lights shall feature multiple flash patterns including steady burn.		
313.	<u>INTERSECTION WARNING LIGHTS COLOR</u>		
	The intersection lights shall be red.		
314.	<u>INTERSECTION WARNING LIGHTS LOCATION</u>		
	The intersection lights shall be mounted on the side of the bumper in the rearward position.		
315.	<u>SIDE WARNING LIGHTS</u>		
	The cab sides shall include two (2) Whelen M6 Super LED warning lights, one (1) on each side. The lights shall feature multiple flash patterns including steady burn for solid colors and multiple flash patterns for split colors. The lights shall be mounted to the sides of the cab within a chrome bezel.		
316.	<u>SIDE WARNING LIGHTS COLOR</u>		
	The warning lights located on the side of the cab shall be red.		
317.	<u>SIDE WARNING LIGHTS LOCATION</u>		
	The warning lights on the side of the cab shall be mounted over the front wheel well directly over the center of the front axle.		
318.	<u>SIDE AND INTERSECTION WARNING SWITCH</u>		
	The side warning lights shall be controlled through a virtual button on the Vista display and control screen. This button shall be clearly labeled for identification.		
319.	<u>SIREN CONTROL HEAD</u>		
	A Whelen 295HFS2 electronic siren control head with remote amplifier shall be provided and flush mounted in the switch panel with a location specific to the customer's needs. The siren shall feature 200-watt output, hands free mode and shall be in "standby" mode awaiting instruction. The siren shall offer radio broadcast, public address, wail, yelp, or piercer tones and hands free operation which shall allow the operator to turn the siren on and off from the horn ring if a horn/siren selector switch option is also selected.		
320.	<u>HORN BUTTON SELECTOR SWITCH</u>		
	A virtual button on the Vista display and control screen shall be provided to allow control of either the electric horn or the air horn from the steering wheel horn button. The electric horn shall sound by default when the selector switch is in either position to meet FMCSA requirements.		
321.	<u>AIR HORN ACTIVATION</u>		
	The air horn activation shall be accomplished by the steering wheel horn button for the driver and two (2) Linemaster model SP491-S81 foot switches, one (1) on the left hand side accessible to the driver and one (1) on the right hand side accessible to the officer. An air horn activation circuit shall be provided to the chassis harness pump panel harness connector.		

322.	<u>MECHANICAL SIREN ACTIVATION</u>		
A	The mechanical siren shall be actuated by two (2) Linemaster model SP491-S81 foot switches mounted in the front section of the cab for use by the driver and officer. A siren brake shall be provided on the Vista display.		
B	The siren shall only be active when master warning switch is on to prevent accidental engagement.		
323.	<u>BACK-UP ALARM</u>		
	An ECCO model 575 backup alarm shall be installed at the rear of the chassis with an output level of 107 dB. The alarm shall automatically activate when the transmission is placed in reverse.		
324.	<u>INSTRUMENTATION</u>		
A	An ergonomically designed instrument panel shall be provided. Each gauge shall be backlit with LED lamps. Stepper motor movements shall drive all gauges. The instrumentation system shall be multiplexed and shall receive ABS, engine, and transmission information over the J1939 data bus to reduce redundant sensors and wiring.		
B	A twenty eight (28) icon lightbar message center with integral LCD odometer/trip odometer shall be included. The odometer shall display up to 999,999.9 miles. The trip odometer shall display 9,999.9 miles. The LCD message center screen shall be capable of custom configuration by the users for displaying certain vehicle status and diagnostic functions.		
C	The instrument panel shall contain the following gauges:		
	One (1) three-movement gauge displaying vehicle speed, fuel level, and Diesel Exhaust Fluid (DEF) level. The primary scale on the speedometer shall read from 0 to 100 MPH, and the secondary scale on the speedometer shall read from 0 to 160 KM/H. The scale on the fuel and DEF level gauges shall read from empty to full as a fraction of full tank capacity. Red indicator lights in the gauge and an audible alarm shall indicate low fuel or low DEF at 1/8 th tank level.		
	One (1) three-movement gauge displaying engine RPM, and primary and secondary air system pressures shall be included. The scale on the tachometer shall read from 0 to 3000 RPM. The scale on the air pressure gauges shall read from 0 to 150 pounds per square inch (PSI) with a red line zone indicating critical levels of air pressure. Red indicator lights in the gauge and an audible alarm shall indicate low air pressure.		
	One (1) four-movement gauge displaying engine oil pressure, coolant temperature, voltmeter, and transmission temperature shall be included. The scale on the engine oil pressure gauge shall read from 0 to 100 pounds PSI with a red line zone indicating critical levels of oil pressure. A red indicator light in the gauge and audible alarm shall indicate low engine oil pressure. The scale on the coolant temperature gauge shall read from 100 to 250 degrees Fahrenheit (°F) with a red line zone indicating critical coolant temperatures. A red indicator light in the gauge and audible alarm shall indicate high coolant temperature. The scale on the voltmeter shall read from 9 to 18 volts with a red line zone indicating critical levels of battery voltage. A red indicator light in the gauge and an audible alarm shall indicate high or low system voltage. The low voltage alarm shall indicate when the system voltage has dropped below 11.8 volts for more than 120 seconds in accordance with the requirements of NFPA 1901. The scale on the transmission temperature gauge shall read from 100 to 300 degrees °F with a red line zone indicating critical temperatures. A red indicator light in the gauge and an audible alarm shall indicate a high transmission temperature.		
	The light bar portion of the message center shall include twenty-eight (28) LED backlit indicators. The lightbar shall be split with fourteen (14) indicators on each side of the LCD message screen. The lightbar shall contain the following indicators and produce the following audible alarms when supplied in conjunction with applicable configurations:		
	<u>RED INDICATORS</u> Stop Engine - indicates critical engine fault		

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	<p>Air Filter Restricted - indicates excessive engine air intake restriction Park Brake - indicates parking brake is set Seat Belt - indicates a seat is occupied and corresponding seat belt remains unfastened Low Coolant - indicates critically low engine coolant Cab Tilt Lock - indicates the cab tilt system locks are not engaged.</p>		
	<p><u>AMBER INDICATORS</u> Malfunction Indicator Lamp (MIL) - indicates an engine emission control system fault Check Engine - indicates engine fault Check Transmission - indicates transmission fault Anti-Lock Brake System (ABS) - indicates anti-lock brake system fault High exhaust system temperature – indicates elevated exhaust temperatures Water in Fuel - indicates presence of water in fuel filter Wait to Start - indicates active engine air preheat cycle Windshield Washer Fluid – indicates washer fluid is low DPF restriction - indicates a restriction of the diesel particulate filter Regen Inhibit-indicates regeneration of the DPF has been inhibited by the operator Range Inhibit - indicates a transmission operation is prevented and requested shift request may not occur. SRS - indicates a problem in the supplemental restraint system Check Message - indicates a vehicle status or diagnostic message on the LCD display requiring attention.</p>		
	<p><u>GREEN INDICATORS</u> Left and Right turn signal indicators ATC - indicates low wheel traction for automatic traction control equipped vehicles, also indicates mud/snow mode is active for ATC system High Idle - indicates engine high idle is active. Cruise Control - indicates cruise control is enabled OK to Pump - indicates the pump is engaged and conditions have been met for pump operations Pump Engaged - indicates the pump transmission is currently in pump gear Auxiliary Brake - indicates secondary braking device is active</p>		
	<p><u>BLUE INDICATORS</u> High Beam indicator</p>		
	<p><u>AUDIBLE ALARMS</u> Air Filter Restriction Cab Tilt Lock Check Engine Check Transmission Open Door/Compartment High Coolant Temperature High or Low System Voltage High Transmission Temperature Low Air Pressure Low Coolant Level Low DEF Level Low Engine Oil Pressure Low Fuel Seatbelt Indicator Stop Engine Water in Fuel Extended Left/Right Turn Signal On</p>		

	ABS System Fault		
325.	<u>BACKLIGHTING COLOR</u>		
	The instrumentation gauges and the switch panel legends shall be backlit using red LED backlighting.		
326.	<u>RADIO</u>		
	A Jensen radio with weather band, AM/FM stereo receiver, compact disc (CD) player, and four (4) speakers shall be installed in the cab. The radio shall include rear RCA input pigtail connector, satellite radio capability, and a covered front auxiliary mini stereo input with iPod ready USB jack. The CD player shall be compatible with CD-R, CD-RW and MP3 format discs. The radio shall be installed in the upper right hand portion of the center dash panel. The speakers shall be installed inside the cab with two (2) speakers recessed within the headliner of the front of the cab just behind the windshield and two (2) speakers on the upper rear wall of the cab.		
327.	<u>AM/FM ANTENNA</u>		
	A small antenna shall be located on the right hand side of the cab roof for AM/FM and weather band reception.		
328.	<u>WI-FI HOTSPOT</u>		
	A vehicle mobile gateway router shall be provided. The device, once supplied with a customer provided USB aircard(s) and data plan SIM card(s), shall produce a mobile Wi-Fi hotspot in and around the vehicle using a cellular data connection. The vehicle router also enhances the vehicle's effective cellular data coverage and range. This option comes with free access to remote configuration software for a year. The mobile data hotspot shall be mounted in the cab, in the overhead above the driver's seating position within a removable bracket for ease of access.		
329.	<u>WI-FI HOTSPOT ANTENNA</u>		
	A mobile gateway Wi-Fi hotspot antenna shall be provided. The antenna shall be mounted on the right hand mid area of the cab roof above the "B" pillar so not to interfere with light bars or other roof mounted equipment installed by Spartan Chassis.		
330.	<u>CAMERA</u>		
A	An Audiovox Voyager heavy duty rearview camera system shall be supplied. One (1) camera with a teardrop shaped chrome plated housing shall be shipped loose for OEM installation in the body to afford the driver a clear view to the rear of the vehicle, one (1) shall be mounted on the driver's side and one (1) on the officers side below the windshield ahead of each front door at approximately the same level as the cab door handles.		
B	The cameras shall be wired to dual Weldon Vista displays located, one (1) on the driver dash and one (1) on the officer dash. The rear camera shall activate when the transmission is placed in reverse, the left and right cameras shall activate with the activation of the respective side turn signal. Each camera shall also activate by a button on the Vista displays.		
331.	<u>TWO-WAY RADIOS</u>		
	A radio wire conduit with a pull wire included shall be installed and routed from behind the dash to under the officer's seat for radio installation by the customer. The officer's under seat storage area shall include an access hole for the conduit cut into the rear face of the seat box. The hole shall be approximately 1.00 inch from the bottom and 1.00 from the inner wall of the seat box.		
A	Additionally, the finished apparatus shall not be manufactured with or contain products that have ozone depleting substances. Contractor shall, upon demand, present evidence that the manufacturing facility meets the above conditions and that it is in compliance with the state EPA rules and regulations.		

332.	<u>CAB EXTERIOR PROTECTION</u>		
	The cab face shall have a removable plastic film installed over the painted surfaces to protect the paint finish during transport to the body manufacturer. The rear wall shall also include a removable plastic film installed on the exterior surface of the cab to protect the finish during transport.		
333.	<u>FIRE EXTINGUISHER</u>		
	A 2.50 pound D.O.T approved fire extinguisher with BC rating shall be shipped loose with the cab.		
334.	<u>ROAD SAFETY KIT</u>		
	The cab and chassis shall include one (1) emergency road safety triangle kit.		
335.	<u>DOOR KEYS</u>		
	The cab and chassis shall include a total of four (4) door keys for the manual door locks.		
336.	<u>INDEPENDENT FIRE PUMP MOUNTING</u>		
A	The fire pump shall be mounted within a separate body module that is not directly connected to the apparatus body. The module shall be mounted to the frame in four locations and in such a manner that should the apparatus be involved in a collision, the likelihood the pump casing cracking is minimized.		
B	The point where the pump module is mounted to the frame shall be reinforced appropriately to carry the expected load for the life of the apparatus.		
C	Plumbing as well as the pump shall be integral with the pump module as much as possible to facilitate the changing of the chassis should the apparatus be involved in a collision.		
D	Chassis frame mounted fire pumps shall not be acceptable.		
337.	<u>MIDSHIP MOUNT FIRE PUMP</u>		
	The pump shall be a Waterous CSUY 2000 GPM fire pump.		
338.	<u>SINGLE STAGE FIRE PUMP</u>		
	The pump shall be a single stage centrifugal class "A" rated fire pump, designed specifically for the fire service.		
339.	<u>INDEPENDENT THIRD PARTY PUMP CERTIFICATION</u>		
A	The fire pump shall be tested and certified, by a nationally recognized independent third party testing company, to perform as listed below:		
	<ul style="list-style-type: none"> • 100% of rated capacity at 150 pounds net pressure. 		
	<ul style="list-style-type: none"> • 70% of rated capacity at 200 pounds net pressure. 		
	<ul style="list-style-type: none"> • 50% of rated capacity at 250 pounds net pressure. 		
	<ul style="list-style-type: none"> • 100% of rated capacity at 165 pounds net pressure. 		
B	The entire pump, both suction and discharge passages, shall be hydrostatically tested to a pressure of 600 PSI. The pump shall be fully tested at the pump manufacturer's factory to the performance spots as outlined by the latest NFPA Pamphlet No. 1901. The pump shall be free from objectionable pulsation and vibration.		

340.	<u>WATEROUS PUMP ANODES</u>		
	There shall be two (2) Anodes provided with the Fire Pump. One (1) anode shall be installed in the left steamer and one (1) shall be installed in the right.		
341.	<u>THERMAL RELIEF VALVE W/INDICATOR</u>		
A	There shall be a Waterous thermal relief valve, installed on the pump. The relief valve shall automatically relieve water from the pump when the temperature of the pump water exceeds the predetermined manufacturer temperature setting. The valve shall automatically reset after activation.		
B	A light installed on the pump operator's panel shall indicate when the valve is not able to maintain so the pump operator may take corrective action.		
342.	<u>IMPELLERS</u>		
A	The pump impellers shall be bronze, specifically designed for the fire service and accurately balanced for vibration free running. The stripping edges shall be located on opposite sides of the impellers to reduce shaft deflection.		
B	The impeller shaft shall be stainless steel, accurately ground to size and supported at each end by oil or grease lubricated anti-friction ball bearings for rigid, precise support. The bearings used on the impeller shaft shall be automotive type bearings, easily cross-referenced and readily available at normal parts or bearing stores.		
343.	<u>FLAME PLATED IMPELLER HUBS</u>		
	The impeller hubs shall be flame plated with tungsten carbide to a hardness approximately twice that of tool steel to assure maximum pump life and efficiency. During the flame plating process the base metal shall not be allowed to exceed a temperature of 300 degrees Fahrenheit to prevent altering the metallurgical properties of the impeller material.		
344.	<u>MECHANICAL SEALS</u>		
A	The pump shall be equipped with self-adjusting, maintenance free mechanical shaft seals that shall not require manual adjustment. These seals shall be designed in a manner such that they shall remain functional enough to permit continued use of the pump in the unlikely event of a seal failure.		
345.	<u>IMPELLER WEAR RINGS</u>		
	The pump shall be equipped with replaceable bronze wear rings for increased pump life and minimum maintenance cost. The wear rings shall be designed to fit into a groove in the face of the impeller hubs forming a labyrinth that, as the clearance increases with age, directs water from the discharge side in several directions eventually exiting outward, away from the eye of the impeller hub.		
346.	<u>PUMP CASING</u>		
	The pump casing shall be cast as two (2) horizontally split pieces. The casing shall be made of high tensile, close-grained gray iron with a minimum tensile strength of 40,000 PSI.		
347.	<u>PUMP TRANSMISSION</u>		
A	The pump transmission shall be of the latest design, incorporating a high strength involute tooth-form Morse Hy-Vo chain capable of operating at high speeds while providing smooth and quiet transmission of power. Drive and driven sprockets shall be made of alloy steel with teeth of an involute form. Driveline shafts shall be made from alloy steel forgings, hardened and ground to size. Deep groove, anti-friction ball bearings shall be used throughout the pump transmission. The pump shift engagement shall be accomplished by a free sliding collar that uses an internal locking mechanism to insure that the collar will stay in road or pump position.		

B	Primary lubrication for the pump transmission bearings, sprockets and chain shall be provided by a splash system. A supplementary pressure system shall also be employed which shall include a strainer, an oil circulation pump driven by the impeller shaft, and a spray bar inside the case to apply oil to the inside of the chain just before it engages the driven sprocket.		
C	The pump and transmission shall be easily separable. A two-piece shaft shall be splined allowing for individual repair of either the pump or transmission, to keep down time to a minimum.		
D	All driveline components shall have a torque rating equal to or greater than the final net engine torque.		
348.	<u>AIR OPERATED PUMP SHIFT</u>		
	The pump shift actuating mechanism shall be air operated from a valve in the cab identified as "PUMP SHIFT". Full instructions for shifting the pump shall be inscribed on the valve plate.		
349.	<u>PUMP SHIFT INDICATING LIGHTS</u>		
A	There shall be two (2) green pump system shift indicator lights in the chassis cab. The first light shall become energized when the chassis parking brake has been set and the pump has completed its shift into pump gear and shall be labeled "Pump Engaged". The second light shall become energized and when the pump and the chassis transmissions have been shifted completely into the correct gears for pumping, this light shall be labeled "OK to Pump".		
B	There shall be one (1) green pump system shift indicator light located on the operator's panel. This light shall only become engaged when the chassis parking brake has been set, and when the pump and the chassis transmissions have been completely shifted into the correct gears. The light shall be located adjacent to the throttle control and shall be labeled "Warning: Do Not Open Throttle Unless Light Is On".		
350.	<u>WATEROUS PRIMER</u>		
	The priming pump, priming valve and piping assembly shall be included in the pump assembly. The priming pump shall be an electrically driven rotary vane pump mounted firmly within the pump area. When the priming pump is in use, it shall be automatically lubricated internally from the primer oil tank with oil that is environmentally safe. The pump shall be controlled from the pump operator's panel. An indicator light on the pump panel shall show when the primer motor is engaged. The pump shall be capable of creating suction and discharging water from a lift of 10 feet through 20 feet of suction hose of the appropriate size, in not more than 30 seconds starting with the pump dry. It shall be capable of developing a vacuum of 22 inches at an altitude of up to 1000 feet.		
351.	<u>CLASS1 TPG+ ELECTRONIC ENGINE GOVERNOR</u>		
A	The apparatus shall be equipped with a Class1 Total Pressure Governor (TPG+) when a Cummins engine is specified or ordered with the chassis.		
B	The TPG+ shall be directly connected to Cummins Electronic Control Module (ECM) mounted on the engine.		
C	The TPG+ shall operate as a throttle and also as a pressure sensor (regulating) governor (PSG). This shall eliminate the need for a relief valve on the discharge side of the pump.		
D	The TPG+ shall display all vital engine operating parameters as follows:		
	• Engine Temperature		
	• Engine Oil Pressure		
	• Engine RPM		
	• System Voltage		

E	Additionally, the information center's alpha/numeric display shall notify the operator of any engine associated problems.		
F	A special preset feature shall permit a predetermined pressure or RPM to be set. When either is preset, the value shall be displayed on the message display of the TPG+. Either value that can be preset shall be easily adjustable by the operator.		
352.	<u>PUMP DRAIN VALVE</u>		
	A Trident manifold drain valve assembly shall be supplied. This drain shall provide the capability to drain the entire pump by turning a single control. The valve assembly shall consist of a stainless steel plate and shaft in a bronze body with multiple ports. The drain valve control shall be mounted on the left side pump panel and identified as "Master Drain".		
353.	<u>PUMP LUBRICATION</u>		
	Grease zerk(s) shall be installed in a convenient location and connected to the pump lubrication points by copper tubing.		
354.	<u>PUMP LUBRICATION POINTS</u>		
	Pump lubrication points shall be connected to the Chassis Vogel Lubrication System by high pressure tubing.		
355.	<u>HEAT EXCHANGER</u>		
A	The engine; (chassis), providing power to drive the fire pump, shall have a supplementary cooling system that uses water from the discharge side of the pump to cool the engine coolant through the use of a closed heat exchanger. The water from the pump and the engine coolant shall not be intermixed. This cooling system shall be controlled by a valve on the pump operator's station.		
B	To prevent damage from freezing, the heat exchanger shall be plumbed through the master pump drain.		
356.	<u>1/2" PUMP COOLER LINE</u>		
	There shall be a 1/2" line installed from the discharge side of the pump to the water tank. The line shall be used to cool the pump during long periods of pumping when water is not being discharged. The pump cooler shall be controlled with a quarter-turn ball valve on operator's panel, and shall be clearly labeled "Pump Cooler".		
357.	<u>PUMP COOLER CHECK VALVE</u>		
A	There shall be a check valve installed in the pump cooler line to prevent tank water from back flowing into the pump when it is not in use.		
358.	<u>INTAKE RELIEF VALVE</u>		
	There shall be an Elkhart 40-41 intake relief valve installed on the suction side of the pump. The valve shall be the preset type, adjustable from 75 to 250 PSI, and shall be designed to prevent vibration from altering the setting. The relief outlet shall be directed below the pump with the discharge terminating in a 2-1/2" male NST connection. The discharge shall be away from the pump operator and labeled "Do Not Cap".		
359.	<u>33,000 BTU PUMP COMPARTMENT HEATER</u>		
A	There shall be a 33,000 BTU heater installed in the pump compartment. The heater shall have an electric fan controlled by a switch on the pump operator's panel. The heating coil shall be connected to the engine cooling circuit with valves in the pump compartment to control the circulation of the engine coolant through the heater.		
B	A pump compartment heater fan switch w/indicator shall be located at the pump panel.		
360.	<u>PUMP MANUAL</u>		
	Two (2) Pump Operation & Maintenance manual(s) in CD format shall be supplied at the time of delivery.		
361.	<u>FIVE YEAR PUMP WARRANTY</u>		

	The fire pump shall be warranted by Waterous for a period of not less than five (5) years from the date of delivery to the fire department.		
362.	<u>TANK TO PUMP CHECK VALVE</u>		
	There shall be a check valve between the pump suction and the booster tank valve. The check valve shall eliminate back flow into the water tank when the pump is connected to a pressurized source.		
363.	<u>WATEROUS TANK TO PUMP VALVE</u>		
A	A 3-1/2" Waterous full flow ball valve shall be installed between the fire pump and the water tank. The valve shall be flanged to bolt directly to the pump and shall incorporate a chromium plated bronze ball. The ball shall be equipped with a hydraulically balanced floating seal assembly that shall self-adjust to correct for wear. The remaining internal moving parts shall be stainless steel for years of dependable service.		
B	The tank to pump valve shall be controlled from the pump operator's panel.		
364.	<u>TANK FILL VALVE</u>		
	There shall be one (1) 2" full-flow tank fill valve plumbed with 2" plumbing from the pump to the tank. Installation shall be completed with 2" Class1 rubber hose. Stainless steel hose couplings shall be utilized. The tank fill valve shall be controlled from the operator's control panel.		
365.	<u>6" STEAMER SUCTION INLETS</u>		
	There shall be two (2) 6" male steamer inlets, one (1) on each side of the apparatus. The suction fittings shall include a removable die cast screen to provide cathodic protection for the pump thus reducing corrosion.		
B	A copy of the warranty certificate shall be submitted with the bid package (no exception).		
366.	<u>SHORT STEAMER BARREL - LEFT SIDE</u>		
A	To accommodate an intake valve without exceeding the legal overall body width, a shorter steamer barrel shall be installed on the left side of the apparatus.		
367.	<u>SHORT STEAMER BARREL - RIGHT SIDE</u>		
A	To accommodate an intake valve without exceeding the legal overall body width, a shorter steamer barrel shall be installed on the right side of the apparatus.		
B	Two (2) 6" NST chrome plated Kochek Model #CB6041C lightweight aluminum long handle steamer cap shall be provided. The cap(s) shall have a blind insert, and vented threads.		
368.	<u>GATED SUCTION INLETS</u>		
A	All suction valves, unless otherwise noted in the specifications, shall be Akron 8800 series brass, quarter-turn, full flow, and swing-out type. Each valve shall be designed in such a manner that the action of water against the regulating element shall not affect its position.		
B	Each valve shall be individually attached to the manifold of the pump with stainless steel pipe. The plumbing to the valve shall contain a minimum of elbows to keep friction loss to a minimum.		
C	The valves located in the pump compartment area shall be partially recessed behind the panel with the portion of the valve that contains water protected from the elements.		
369.	<u>INTAKE DRAINS</u>		
	Each gated intake shall be equipped with a Class1 3/4" quarter turn bleeder valve. The bleeder valve shall be equipped with a chrome plated handle to provide a positive grip while personnel are wearing gloves.		

370.	<u>INTAKE TRIM PLATES</u>		
	Each gated intake shall have a polished cast aluminum trim plate around the intake valve and fitting. The trim plate shall be easily removable without the need to disturb the valve.		
371.	<u>SLOW CLOSE MECHANISMS</u>		
	Gated intakes that are 3" or larger shall be equipped with a mechanism to prevent changing the position of the valve from full open to full close, or vice-versa, in less than 3 seconds.		
372.	<u>INTAKE STRAINERS</u>		
	Removable strainers shall be provided with each gated intake.		
373.	<u>LEFT SIDE 2-1/2" GATED INTAKE(S)</u>		
A	There shall be one (1) 2-1/2" gated intake(s) provided on the left side of the pump compartment. The intake shall be furnished with a 2-1/2" Akron valve and 2-1/2" plumbing. The intake shall terminate with a 2-1/2" NST female chrome swivel.		
B	The valves located in the pump compartment area shall be partially recessed behind the panel with the portion of the valve that contains water protected from the elements		
C	There shall also be a Kochek Model #PC2552C lightweight aluminum 2-1/2" NST rocker lug plug with K- Chrome finish provided on the adapter. A retention chain shall be included with the plug.		
374.	<u>RIGHT SIDE 2-1/2" GATED INTAKE(S)</u>		
A	There shall be one (1) 2-1/2" gated intake(s) provided on the right side of the pump compartment. The intake shall be furnished with a 2-1/2" Akron valve and 2-1/2" plumbing. The intake shall terminate with a 2-1/2" NST female chrome swivel. A 2-1/2" chrome plated plug shall be supplied and attached to the bezel by means of a chain.		
B	The valves located in the pump compartment area shall be partially recessed behind the panel with the portion of the valve that contains water protected from the elements.		
C	There shall also be a Kochek Model #PC2552C lightweight aluminum 2-1/2" NST rocker lug plug with K- Chrome finish provided on the adapter. A retention chain shall be included with the plug.		
375.	<u>5" FRONT SUCTION INLET</u>		
	There shall be one (1), 5" vertical steamer inlet on the right front of the apparatus. The intake shall be plumbed with 5" plumbing. Class 1 high pressure flex hose shall be used in the plumbing of this intake.		
376.	<u>WATEROUS PRIMER FRONT SUCTION</u>		
	The priming pump, priming valve and piping assembly shall be included in the pump assembly for the front suction in addition to the main pump primer. The priming pump shall be an electrically driven rotary vane pump mounted firmly within the pump area. When the priming pump is in use, it shall be automatically lubricated internally from the primer oil tank with oil that is environmentally safe. The pump shall be controlled from the pump operator's panel. An indicator light on the pump panel shall show when the primer motor is engaged. The pump shall be capable of creating suction and discharging water from a lift of 10 feet through 20 feet of suction hose of the appropriate size, in not more than 30 seconds starting with the pump dry. It shall be capable of developing a vacuum of 22 inches at an altitude of up to 1000 feet.		

377.	<u>DRAIN VALVES</u>		
	The front suction plumbing shall be equipped with drain valves. The drain valves shall be located in the lowest points of the plumbing to allow for proper drainage.		
378.	<u>AIR OPERATED VALVE</u>		
	The front inlet shall be gated with an air-operated valve at the pump operator's panel. The actuator shall have a snubber for controlling the speed in which the valve opens and closes. There shall be an Elkhart 40-41 intake relief valve provided in the front suction line, as per NFPA.		
379.	<u>FRONT SUCTION / INTAKE SWIVEL</u>		
A	There shall be a 90 degree chrome swivel installed on the vertical front inlet. The swivel shall adapt from 5" FNPT to 6" MNST.		
B	One (1) 6" NST chrome plated Kochek Model #CB6041C lightweight aluminum long handle steamer cap shall be provided. The cap(s) shall have a blind insert, and vented threads.		
380.	<u>BLEEDER VALVE</u>		
	There shall be a bleeder valve provided on the pump panel for the steamer / intake. The valve shall be used to bleed off air or water as per NFPA requirements.		
381.	<u>FRONT SUCTION / INTAKE PRIMER VALVE</u>		
	An additional primer valve shall be provided on the pump panel. The secondary primer valve shall be dedicated to the front suction plumbing to allow trapped air to be expelled from the system.		
382.	<u>BOOSTER REEL</u>		
A	There shall be one (1) Hannay steel fabricated electric booster reel, with a capacity of 200' of booster hose. The reel shall have a 1-1/2" quarter turn ball valve controlled from operator's panel and piping connected with 1-1/2" flexible hose. An automatic brake and an auxiliary manual rewind crank shall be supplied.		
B	The reel shall be located in the dunnage compartment above the water pump the front forward left side.		
383.	<u>RED BOOSTER REEL</u>		
	One (1) booster reel(s) shall be ordered from the reel manufacturer painted standard red and shall not be repainted to match the apparatus body.		
384.	<u>BOOSTER REEL GUIDE ROLLERS</u>		
	The booster reel shall be equipped with one (1) set(s) of hose guide rollers.		
385.	<u>BOOSTER HOSE</u>		
	Two (2) 100' x 1" section(s) of 800# test booster hose coupled with 1" NST pyrolite couplings shall be supplied.		
386.	<u>NOZZLE CLIP</u>		
	There shall be a Zico Nozzle Clip Model #CLN-200 provided with the apparatus to be used with the booster reel.		
387.	<u>BOOSTER REEL PURGE SYSTEM</u>		
	One (1) valve stem(s) shall be installed in the booster hose reel. This shall allow an air hose to be applied to the hose reel(s) so any water can be blown out of the hose for cold weather storage.		
388.	<u>BOOSTER REEL REWIND BUTTON</u>		

A	There shall be one (1) rubber covered push button switch installed for the rewind control of the booster reel.		
B	The rewind switch shall be located left side pump panel.		
389.	<u>CROSSLAY PRECONNECT HOSE BED</u>		
A	Cross lay preconnects shall have 90 degree elbow type swivel on discharge outlets. The flooring shall be punched to allow for adequate ventilation and drainage.		
B	The divider(s) between the hose bed areas shall be fabricated of 3/16" aluminum. It shall be mounted in a channel on each end for adjustability.		
390.	<u>ABRADED FINISH CROSSLAY HOSEBED</u>		
	The crosslay hose bed and dividers shall have a maintenance free abraded finish.		
391.	<u>VINYL CROSSLAY COVER</u>		
A	The crosslays shall have a vinyl coated nylon cover installed. The front edge of the cover shall be retained in a "C" channel to prevent wind from lifting it. The back of the cover shall be attached to the apparatus body using twist lock type fasteners.		
B	The cover shall be red in color.		
392.	<u>CROSSLAY / SPEEDLAY END COVER</u>		
	There shall be a webbing restraint located on each end of the pre-connected crosslay / speedlay. The webbing shall be easily opened in the center with velcro closures.		
393.	<u>CROSSLAY ROLLERS</u>		
	Stainless steel rollers shall be provided at each end of the crosslay hose bed to facilitate deployment of hose. Vertical rollers shall be installed on each side of the hose bed opening, and a horizontal roller shall be installed under the opening.		
394.	<u>PUMP DISCHARGES</u>		
	All discharge valves, unless otherwise noted in the specifications, shall be Akron 8800 series, quarter-turn, full flow, swing-out type. The flow regulating element of each valve shall not change its position under any condition of operation involving discharge pressures to the maximum pressure of the pump. The means to prevent a change in position shall be incorporated in the operating mechanism and shall be permitted to be manually controlled.		
395.	<u>LOCATION OF DISCHARGE OUTLETS</u>		
	No discharge outlets larger than 2-1/2" shall be located on the pump operator's panel.		
396.	<u>STAINLESS STEEL PLUMBING</u>		
	Each valve shall be individually attached to the manifold of the pump with stainless steel pipe. The plumbing to the valve shall contain a minimum of elbows to keep friction loss to a minimum. The use of high pressure hose will be used in as many places as practical.		
397.	<u>DRAIN VALVES</u>		
A	Each discharge 2-1/2" or larger, with the exception of the crosslays and hard to access plumbing, shall be equipped with a 3/4" quarter turn Class1 drain between the valve and the discharge. There shall be a chrome plated round handle provided on each drain valve to facilitate use with a gloved hand.		
B	Drain valves shall be located in a row just above the running board and below the pump panel on each side of the apparatus pump compartment to reduce clutter in the pump panel area. Each drain valve shall be color coded to match the appropriate line it is connected to. The drain valves shall be connected to the individual valves with flexible hose that is routed in such a manner as to assure complete drainage. Discharge from the drain valves shall be routed to below the apparatus.		
398.	<u>AUTOMATIC DRAINS</u>		
A	Crosslay and hard to access discharges shall be equipped with Class1, model 34AD automatic		

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	drains. These drains shall open whenever the pressure in the discharge line drops below 5 PSI. The drains shall be located in areas that shall allow the entire line to drain effectively. More than one drain shall be used in lines that are uneven along their length.		
B	Where the drain valve is located above the frame rails of the chassis, the outlets shall be extended with hoses to below the chassis frame rails.		
399.	<u>DISCHARGE ELBOWS</u>		
	All discharges that are 2" or larger and are 42" or more above grade shall be equipped with a downward pointing elbow of 30 degrees or more.		
400.	<u>SLOW CLOSE MECHANISMS</u>		
	Discharges that are 3" or larger shall be equipped with a valve mechanism to prevent changing the position of the valve from full open to full close, or vice-versa, in less than 3 seconds as required by NFPA.		
401.	<u>FRONT BUMPER 1-1/2" DISCHARGE</u>		
	There shall be one (1) 1-1/2" NST discharge installed to the left side of the front bumper. The discharge shall be plumbed with a 2" Akron valve and 2" plumbing. Class1 high pressure flex hose with stainless steel couplings shall be used in the plumbing of this discharge.		
402.	<u>CHROME DISCHARGE SWIVEL</u>		
	The front bumper discharge shall be equipped with a chrome swivel. The swivel assembly shall have a 2" victaulic pipe end and a 1 1/2" male NST end. The swivel shall have a specially designed elbow that reduces friction loss. An appearance grade (polished) swivel shall be used for front bumper discharges.		
403.	<u>1-1/2" PRECONNECT LEFT REAR</u>		
	There shall be two (2) 1-1/2" NST preconnect discharge(s) located at the left front of the hosebed. The discharge shall be plumbed with a 2" Akron valve and 2" plumbing.		
404.	<u>LEFT SIDE 2-1/2" DISCHARGES</u>		
A	There shall be two (2) 2-1/2" NST discharge(s) on the left side of the pump compartment. The discharge shall be plumbed with a 2-1/2" Akron valve and 2-1/2" plumbing.		
B	The right side 2-1/2" discharge shall be located forward of the LDH outlet.		
405.	<u>DISCHARGE ADAPTER(S)</u>		
A	There shall be two (2) Kochek Model #37R2515C rigid female to male lightweight aluminum adapter with rocker lugs and K-Chrome finish provided. Threads shall be: 2-1/2" NST female x 1-1/2" NST male.		
B	The adapter shall be located left side discharges.		
C	There shall also be a Kochek Model #CC1552C lightweight aluminum 1-1/2" NST rocker lug cap with K- Chrome finish provided on the adapter. A retention chain shall be included with the cap.		
406.	<u>RIGHT SIDE 2-1/2" DISCHARGES</u>		
	There shall be one (1) 2-1/2" NST discharge(s) on the right side of the pump compartment. The discharge shall be plumbed with a 2-1/2" Akron valve and 2-1/2" plumbing.		
407.	<u>DISCHARGE ADAPTER(S)</u>		
A	There shall be one (1) Kochek Model #37R2515C rigid female to male lightweight aluminum adapter with rocker lugs and K-Chrome finish provided. Threads shall be: 2-1/2" NST female x 1-1/2" NST male.		
B	The adapter shall be located right side discharge.		
C	There shall also be a Kochek Model #CC1552C lightweight aluminum 1-1/2" NST rocker lug cap with K- Chrome finish provided on the adapter. A retention chain shall be included with the cap.		
408.	<u>RIGHT REAR 2-1/2" DISCHARGES</u>		

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	There shall be two (2) 2-1/2" NST discharge(s) located at the right rear of the apparatus. The discharge shall be plumbed with a 3" Akron valve and 3" plumbing.		
409.	<u>ELKHART RC-10 HANDWHEEL ACTUATED CONTROL</u>		
A	The discharge valve shall be controlled by an Elkhart RC-10 slow-closing remote linear output screw-type actuator. The actuator housing and push-rod shall be constructed of light weight extruded aluminum. A precision needle thrust bearing and hardened thrust washers shall assure smooth, efficient operation and accurate flow and pressure control capability. A 5" cast aluminum handwheel shall allow for compact through-the-panel installation.		
B	The valve status indicator module shall provide the pump operator with the status of the valve at a glance. Red shall mean fully closed; Green shall mean fully opened; Yellow shall indicate a gated position. Incandescent lamps shall provide a reliable signal with a wide viewing angle even in bright sun light. Reliable solid state valve position sensors shall be water and lubricant resistant; the integrated circuit board and lamp sockets shall be completely encased in epoxy for total protection from elements.		
410.	<u>DISCHARGE ADAPTER(S)</u>		
A	There shall be two (2) Kochek Model #37R2515C rigid female to male lightweight aluminum adapter with rocker lugs and K-Chrome finish provided. Threads shall be: 2-1/2" NST female x 1-1/2" NST male.		
B	The adapter shall be located rear right 2-1/2" discharge.		
C	There shall also be a Kochek Model #CC1552C lightweight aluminum 1-1/2" NST rocker lug cap with K-Chrome finish provided on the adapter. A retention chain shall be included with the cap.		
411.	<u>RIGHT SIDE 4" LARGE DIAMETER DISCHARGE</u>		
A	There shall be one (1) 4" NST discharge located on the right side pump panel. The discharge shall be plumbed with a 3-1/2" Akron valve and 4" plumbing. The 4" discharge shall be controlled by an Akron Handwheel. The handwheel worm gear shall be connected to the remote mounted valve via a rod assembly. The handwheel shall turn a gear sector mounted on the valve for smoother and easier operations under pressure.		
B	A Position Indicator shall show the position of the ball valve as per NFPA 1901. Opening and closing speed shall comply with the current NFPA Standard to minimize effects of water hammer.		
412.	<u>REAR 4" LARGE DIAMETER DISCHARGE</u>		
A	There shall be one (1) 4" NST discharge located on the rear of the body. The discharge shall be plumbed with a 4" Akron model 8840 valve and 4" plumbing. The 4" discharge shall be controlled by an Akron Handwheel. The handwheel worm gear shall be connected to the remote mounted valve via a rod assembly. The handwheel shall turn a gear sector mounted on the valve for smoother and easier operations under pressure.		
B	A Position Indicator shall show the position of the ball valve as per NFPA 1901. Opening and closing speed shall comply with the current NFPA Standard to minimize effects of water hammer.		
413.	<u>ELBOW ADAPTER</u>		
A	There shall be one (1) Kochek Model SKE44R lightweight aluminum 30 degree elbow provided. Threads shall be: 4" swivel female NST with rocker lugs to 5" Storz.		
B	The adapter shall be located rear left 4" discharge.		
414.	<u>4" STORZ CAP & CHAIN</u>		
A	There shall be one (1) Kochek Model #CC407 lightweight aluminum 5" Storz cap with K-Brite finish provided. A chain attachment shall be also supplied.		
B	The Storz blind cap shall be located rear left 4" discharge.		

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415.	<u>VALVE CONTROLS</u>		
A	All 2-1/2" or smaller valves shall be controlled by a Trident quarter turn locking type push/pull control with direct linkages and universal yokes. Control rods shall be hard coated anodized aluminum 3/4" rod and polished chrome plated zinc handles.		
B	The centerline of any valve control shall be no more than 72" vertically above the platform that serves as the pump operator's position.		
416.	<u>FOAM PRO 2001 DUAL FOAM SYSTEM</u>		
A	The apparatus shall be equipped with a Hypro FoamPro 2001 manual, variable speed, direct injection, and discharge side foam proportioning system. The system shall be capable of handling Class A foam concentrates and most Class B foam concentrates. The foam proportioning operation shall be based on direct measurement of water flows, and remain consistent within the specified flows and pressures. The system shall be capable of delivering accuracy to within 3% of calibrated settings over the advertised operation range when installed according to factory standards. The system shall be equipped with a digital electronic control display, suitable for installation on the pump panel. Incorporated within the control display shall be a microprocessor that receives input from the system flow meter(s), while also monitoring foam concentrate pump output, comparing values to ensure that the operator preset proportional amount of foam concentrate is injected into the discharge side of the fire pump.		
B	A paddlewheel type flow meter shall be installed in the manifold specified for foam capable discharges.		
C	The digital computer control display shall enable the pump operator to perform the following control and operation functions for the foam proportioning system:		
	<ul style="list-style-type: none"> • Provide push-button control of foam proportioning rates from 0.1% to 9.9% in 0.1% increments. 		
	<ul style="list-style-type: none"> • Show current flow-per-minute of water. 		
	<ul style="list-style-type: none"> • Show total volume of water discharged during and after foam operations are completed. 		
	<ul style="list-style-type: none"> • Show total amount of foam concentrate consumed. 		
	<ul style="list-style-type: none"> • Simulate flow rates for manual operation. 		
	<ul style="list-style-type: none"> • Perform setup and diagnostic functions for the computer control microprocessor. 		
	<ul style="list-style-type: none"> • Flash a low concentrate warning when the foam concentrate tank(s) run(s) low. 		
	<ul style="list-style-type: none"> • Flash a no concentrate warning and shut the foam concentrate pump off, preventing damage to the pump, should the foam tank(s) empty. 		
D	A 12 volt electric motor driven positive displacement foam concentrate pump, rated up to 2.5 GPM, with operating pressures up to 400 PSI, shall be installed in a suitable compartment near the apparatus pump house. A pump motor electronic driver (mounted to the base of the pump) shall receive signals from the computer control display, and power the 1/2 horsepower electric motor directly coupled to the concentrate pump in a variable speed duty cycle to ensure that the correct proportion of concentrate preset by the pump operator is injected into the water stream.		
E	System Capacity shall be as follows:		
	<u>Foam Concentrate</u>	<u>2001 Maximum Water Flow GPM (LPM)</u>	
	0.2%	1300 (4921)	
	0.5%	520 (1968)	
	1.0%	260 (984)	

	3.0%	85 (322)		
F	A manual dual tank valve shall provide manual switchover of dual foam concentrate tanks from the operator panel position. The dual tank valve handle shall also have a flush position between the dual tank settings. The flush position shall provide a clean water flush of the foam concentrate pump preventing foam concentrates from mixing and possible jelling. The system shall automatically read the low tank sensor for whichever foam tank is in use. The valve shall be capable of operating pressures to 500 psi.			
G	A full flow check valve shall be provided to prevent foam contamination of fire pump and water tank or water contamination of foam tank.			
H	Components of the complete proportioning system as described above shall include:			
	<ul style="list-style-type: none"> • Operator control and display. 			
	<ul style="list-style-type: none"> • Paddlewheel flow meter. 			
	<ul style="list-style-type: none"> • Pump and electric motor/motor driven. 			
	<ul style="list-style-type: none"> • Wiring harnesses. 			
	<ul style="list-style-type: none"> • Two (2) Low level tank switch. 			
	<ul style="list-style-type: none"> • Manual dual tank valve. 			
	<ul style="list-style-type: none"> • Foam injection check valve. 			
I	Installation and operation manual shall be provided for the unit, along with a one-year limited warranty.			
	The foam system shall be plumbed to the following discharges:			
	<ul style="list-style-type: none"> • One (1) Front 1-1/2" trashline 			
	<ul style="list-style-type: none"> • Booster Reel discharge 			
	<ul style="list-style-type: none"> • One (1) 2.5" Discharge 			
	<ul style="list-style-type: none"> • One (1) 1.75" Pre-connect 			
417.	<u>POLYPROPYLENE FOAM CELL</u>			
A	There shall be one (1) 8 gallon polypropylene foam cell(s) incorporated into the polypropylene water tank.			
B	There shall be one (1) pressure/vacuum vent installed on the foam tank.			
C	There shall be one (1) drain hose connected to the foam cell. The drain shall have a 1/4 turn valve installed inside the pump house and it shall drain below the frame rail of the chassis.			
418.	<u>POLYPROPYLENE FOAM CELL</u>			
A	There shall be one (1) 12 gallon polypropylene foam cell(s) incorporated into the polypropylene water tank.			
B	There shall be one (1) pressure/vacuum vent installed on the foam tank.			
C	There shall be one (1) drain hose connected to the foam cell. The drain shall have a 1/4 turn valve installed inside the pump house and it shall drain below the frame rail of the chassis.			

419.	<u>DELUGE MONITOR RISER</u>		
A	There shall be one (1) 3" riser for a deluge monitor installed above the pump on the apparatus. The discharge shall be plumbed with a 3-1/2" Waterous Full-Flow ball valve and 3" plumbing. The ball valve shall be controlled with a Waterous hand crank located on the left side pump panel.		
B	An LED indicator shall show the position of the ball valve as per NFPA 1901. Opening and closing speed shall comply with the current NFPA Standard to minimize effects of water hammer.		
420.	<u>TASK FORCE TIPS EXTENDA-GUN FOR DECK GUN</u>		
	There shall be a Task Force Tips model XG Extend-A-Gun installed on the deck gun plumbing. The Extend-A-Gun shall provide greater clearance of apparatus lights, equipment and personnel. It shall be operable in either the raised or lowered position and shall provide a full 360 degree rotation. The extension shall be wired to the compartment open door circuitry to warn if left in the extended position.		
421.	<u>WATER TANK</u>		
	The water tank shall have a capacity of 750 U.S. Gallons. Certification of the tank capacity shall be recorded on the manufacturer's record of construction and shall be provided to the purchaser upon delivery of the apparatus.		
422.	<u>UPF POLY TANK CONSTRUCTION</u>		
	The UPF Poly-Tank ® IIE shall be constructed of 1/2" thick PT2E™ polypropylene sheet stock. This material shall be a noncorrosive stress relieved thermoplastic, black in color, and U.V. stabilized for maximum protection.		
423.	<u>BOOSTER TANK</u>		
	The booster tank shall be of a specific configuration and shall be so designed to be completely independent of the body and compartments. All joints and seams shall be nitrogen welded and tested for maximum strength and integrity. The top of the booster tank shall be fitted with removable lifting eyes designed with a 3 to 1 safety factor to facilitate easy removal.		
424.	<u>TANK BAFFLES</u>		
	The transverse swash partitions shall be manufactured of 3/8" PT2E™ polypropylene (natural in color) and extend from approximately 4" off the floor to just under the cover. The longitudinal swash partitions shall be constructed of 3/8" PT2E polypropylene (natural in color) and extend to the floor of the tank through the cover to allow for positive welding and maximum integrity. All partitions shall be equipped with vent and air holes to permit movement of air and water between compartments. The partitions shall be designed to provide maximum water flow. All swash partitions shall interlock with one another and be welded to each other as well as to the walls of the tank.		
425.	<u>TANK SUMP</u>		
	There shall be one (1) sump in the bottom of the water tank. The sump shall be constructed of 1/2" polypropylene and shall be located in the left front quarter of the tank. On all tanks that require a front suction, a 4" schedule 40 polypropylene pipe shall be installed that will incorporate a dip tube from the front of the tank to the sump location. The sump shall be used as a combination clean-out and drain. All tanks shall have an anti-swirl plate located approximately 2" above the sump to pre-vent air from being entrained in the water while pumping.		

426.	<u>TANK FILL CONNECTION</u>		
	All tank fill couplings shall be backed with flow deflectors to break up the stream of water entering the tank, and shall be capable of withstanding sustained fill rates of up to 1,000 GPM.		
427.	<u>TANK LID</u>		
	The tank lid shall be constructed of 1/2" thick PT2E™ polypropylene to incorporate a multi three-piece locking design that allows for individual removal and inspection if necessary. The tank lid shall be recessed 3/8" from the top of the tank and shall be welded to both sides and longitudinal partitions for maximum integrity. Each one of the lids shall have hold downs consisting of 2" polypropylene dowels spaced a maximum of 30" apart. These dowels shall extend through the covers and shall assist in keeping the covers rigid under fast filling conditions. A minimum of two lifting dowels shall be drilled and tapped 1/2" x 13" to accommodate the lifting eyes.		
428.	<u>TANK MOUNTING</u>		
A	The UPF Poly-Tank IIE shall rest on the body cross members in conjunction with such additional cross members, as required by the tank manufacturer		
B	The tank shall be isolated from the cross members through the use of hard rubber strips with, a minimum Rockwell Hardness of 60 durometer. Additionally, the tank shall be supported around the entire perimeter and captured both front and rear as well as side to side to prevent the tank from shifting during vehicle operation.		
C	Although the tank shall be designed on a free floating suspension principle, it shall be required that the tank have adequate hold down restraints to minimize movement during vehicle operation.		
D	The tank shall be completely removable without disturbing or dismantling the apparatus structure.		
429.	<u>LIFETIME TANK WARRANTY</u>		
	The tank shall have a lifetime warranty from UPF.		
430.	<u>WATER TANK FILL TOWER</u>		
	The tank shall have a combination vent and manual fill tower, marked "Water Fill." The fill tower shall be constructed of 1/2" PT2E polypropylene and shall be a minimum dimension of 8" x 8" at the outer perimeter. The tower shall be located in the left front corner of the tank. The tower shall have a 1/4" thick removable polypropylene screen and a PT2E polypropylene hinged-type cover.		
431.	<u>UPF TANK OVERFLOW</u>		
	The tank shall be equipped with a minimum of a 4" schedule 40 polypropylene overflow / air vent pipe. The pipe shall be installed in the fill tower and extend through the tank and dump to the rear of the rear axle.		
432.	<u>HOT DIPPED GALVANIZED CRADLE FOR WATER TANK MOUNTING</u>		
A	The tank mounting shall be a simple style cradle. This cradle shall be designed for the specific tank, and shall provide support in the areas and locations specified by the tank manufacturer. After fabrication the cradle shall be hot dip galvanized for maximum protection against corrosion.		
B	The tank cradle shall have a lifetime warranty		

433.	<u>TANK DRAIN VALVE</u>		
	One (1) 1-1/2" tank drain valve(s) shall be provided under the tank sump. The valve shall have a locking lever to prevent accidental draining of the tank.		
434.	<u>TANKVISION "CLASS A" FOAM TANK GAUGE</u>		
	The level gauge shall have 9 super bright LEDs to show the tank volume. The display shall use a 2 dimensional 2-element lens to refract the light from the LEDs to provide full 180° visibility for the level indication. The gauge shall use a pressure transducer installed near the bottom of the foam tank to determine the correct volume in the tank. The gauge shall be self-calibrating by filling the tank at a steady flow rate. Self-diagnostics capabilities shall be standard on all gauges. The gauge shall start to flash when the tank volume is at ¼ tank or less and use down scrolling LEDs to alert the pump operator when the tank is almost empty.		
435.	<u>TANKVISION "CLASS B" FOAM TANK GAUGE</u>		
	The level gauge shall have 9 super bright LEDs to show the tank volume. The display shall use a 2 dimensional 2-element lens to refract the light from the LEDs to provide full 180° visibility for the level indication. The gauge shall use a pressure transducer installed near the bottom of the foam tank to determine the correct volume in the tank. The gauge shall be self-calibrating by filling the tank at a steady flow rate. Self-diagnostics capabilities shall be standard on all gauges. The gauge shall start to flash when the tank volume is at ¼ tank or less and use down scrolling LEDs to alert the pump operator when the tank is almost empty.		
436.	<u>TANKVISION WATER TANK GAUGE - MINI SLAVE</u>		
	There shall be a mini water tank level gauge provided in the cab. The level gauge shall have 5 super bright LEDs to show the tank volume. The display shall use a 2 dimensional 2-element lens to refract the light from the LEDs to provide full 180° visibility for the level indication. The gauge shall be wired into the master tank gauge on the pump panel. The gauge shall start to flash when the tank volume is at ¼ tank or less and use down scrolling LEDs to alert the pump operator when the tank is almost empty.		
437.	<u>TANKVISION WATER TANK GAUGE - FULL SIZE SLAVE</u>		
A	There shall be a one (1) additional water tank level gauge provided. The additional gauge shall be connected to the master tank water tank gauge on the pump panel. The level gauge shall have 9 super bright LEDs to show the tank volume. The display shall use a 2 dimensional 2-element lens to refract the light from the LEDs to provide full 180° visibility for the level indication. The gauge shall start to flash when the tank volume is at ¼ tank or less and use down scrolling LEDs to alert the pump operator when the tank is almost empty.		
B	Located on right side pump panel.		
438.	<u>TANKVISION WATER TANK GAUGE</u>		
	The level gauge shall have 9 super bright LEDs to show the tank volume. The display shall use a 2 dimensional 2-element lens to refract the light from the LEDs to provide full 180° visibility for the level indication. The gauge shall use a pressure transducer installed near the bottom of the water tank to determine the correct volume in the tank. The gauge shall be self-calibrating by filling the tank at a steady flow rate. Self-diagnostics capabilities shall be standard on all gauges. The gauge shall start to flash when the tank volume is at ¼ tank or less and use down scrolling LEDs to alert the pump operator when the tank is almost empty.		

439.	<u>CONTROL PANEL</u>		
A	The left side of the pump enclosure shall be divided into two sections. The lower section shall be where all valve controls, the primer control, the discharge relief valve controls (pilot valve), and other mechanical controls are located. This surface shall be referred to as the "control panel".		
B	All valve controls shall be the self-locking type, activated by either direct control or with a direct linkage utilizing friction locking bell cranks and universal ball swivels. The primary valve handles shall have color coded tags installed in a recessed area to clearly denote the purpose of each control.		
440.	<u>INSTRUMENT PANEL</u>		
A	The surface above the control panel shall contain all instruments, gauges, test fittings, and optional controls. This surface shall be referred to as the "instrument panel". The instrument panel shall be independent and hinged and latched so that it may be opened. All instruments, gauges, and other equipment shall be installed with sufficient slack in any cabling, tubing, or plumbing to allow the panel to swivel to the fully open position.		
B	The instrument and gauge panel shall be vertically hinged "swing out" to provide access for service.		
441.	<u>COLOR CODED LABELS</u>		
	To improve identification of discharges and intakes, color coded tags shall be provided. The tags shall utilize an etching process to provide easy visibility and improved field service life. Tags shall be affixed using an industrial grade adhesive backing, eliminating the need for pop rivets or screws into the panel or control handle.		
442.	<u>RIGHT SIDE PUMP PANEL</u>		
	A single panel shall be installed on the right side of the pump enclosure. This shall be the area where any right side discharges, inlets, steamers, and other pump associated equipment are located. This panel shall be easily removable and held in place with quick release push latches. It shall be fully removable for pump and plumbing access without the need to use hand tools. Any electrical equipment that may be installed shall be equipped with connectors so they may be easily separated from the opening created when the below described front access panel is removed.		
443.	<u>PUMP PANEL LIGHTS</u>		
A	The pump operator's control panel and the right side pump panel shall each be illuminated by a minimum of four (4) lights. Each light assembly shall have a plastic or lexan lens to protect the lamp from the elements.		
B	The pump panel lights shall become energized upon setting the parking brake so the gauge information provided may be consulted at any time the apparatus is parked.		
C	A stainless steel shield shall be installed over the pump panel lights to further protect them from the elements and to act as a reflector for additional illumination.		
444.	<u>PANEL SURFACES</u>		
	The control panel, instrument panel, and right side pump panel shall be coated with a thermoplastic material for maximum resistance to abrasion and to minimize glare. The material shall be capable of withstanding the effects of extreme temperatures and weather.		
445.	<u>COLOR CODED GAUGE/ PANEL TRIM RINGS</u>		
	All discharges and intakes shall have matching color and lettered rings for identification for each corresponding discharge. Color identification shall be 360 degrees around each gauge and discharge		

446.	<u>PRESSURE / VACUUM TEST PORTS</u>		
	Class1 model 102709 pressure and vacuum test ports shall be provided on the pump panel.		
447.	<u>PUMP COOLER VALVE</u>		
	Class1 model 34BV pump cooling control valve shall be provided on the pump panel.		
448.	<u>ENGINE COOLER VALVE</u>		
	Class1 model 34BV engine cooling control valve shall be provided on the pump panel.		
449.	<u>WHITE FACE / BLACK NUMERAL GAUGE DISPLAY</u>		
	The master pump gauges and individual pressure gauges shall have a white face with black numbers and lettering. This shall provide a high contrast and allow the gauges to be easily read by the operator.		
450.	<u>CLASS1 PRESSURE GAUGES</u>		
	There shall be eleven (11) Class1 individual pressure gauges installed on the pump panel. Each gauge shall be Interlube filled to insure proper operations to minus 40 degrees. Each gauge shall read 0-400 PSI and shall be a minimum of 2-1/2" in diameter.		
451.	<u>CLASS1 INSTRUMENT PANEL MASTER PUMP GAUGES</u>		
	The pump vacuum and pressure gauges shall be supplied by Class1. Each gauge shall be Interlube filled to insure proper operations to minus 40 degrees. Each gauge shall read -30-0-400 PSI and shall be a minimum of 4-1/2" in diameter.		
452.	<u>FUEL TANK GAUGE AT PUMP PANEL</u>		
	There shall be a fuel tank gauge provided on the pump panel. The gauge shall provide fuel tank readout for the pump operator during fire ground operations.		
453.	<u>TRANSMISSION TEMPERATURE GAUGE AT PUMP PANEL</u>		
	There shall be a temperature gauge provided on the pump panel. The gauge shall provide chassis transmission temperature readout for the pump operator during fire ground operations.		
454.	<u>PUMP HOUR METER</u>		
	There shall be a pump hour meter provided and installed inside the pump compartment. The hour meter shall be activated only when the water pump has been engaged.		
455.	<u>DUNNAGE COMPARTMENT</u>		
	There shall be a dunnage compartment above the pump compartment. The dunnage compartment shall be constructed of treadbrite and shall serve as a location for mounting the generator.		
456.	<u>INDEPENDENT PUMP COMPARTMENT</u>		
	The main body and the pump compartment shall be fabricated as individual units. Both the body and pump compartment shall be fabricated using precision holding fixtures to ensure proper dimensions. All attachment points shall be heavily reinforced.		
457.	<u>5052-H32 ALUMINUM</u>		
	All body compartments shall be fabricated of 1/8", 5052-H32, smooth aluminum plate. The complete body shall be fabricated using break and bend techniques to form strong yet flexible Uni-Body structures.		
458.	<u>BODY SUBFRAME</u>		
A	To assure proper body alignment and clearance, the body sub frame shall be constructed in a jig and fitted directly on the chassis.		
B	The chassis frame rails shall be fitted with fiber reinforced rubber to isolate the body frame members from direct contact with chassis frame rails.		

C	The main body sub frame shall be constructed from steel tubing. The sub frame shall run the full length of the body and shall be spaced the same width as the chassis frame rails. The main sub frame shall also be the integral support for the water tank. Vertical drop tubes shall be welded to the sub frame. From these vertical drop tubes shall extend cross members constructed of steel angle. These cross members shall extend out to support the compartments. Cross members shall be located at the front and rear of the body and in front and rear of the wheel well opening.		
D	The compartment area behind the rear axle shall be supported by a drop frame fabricated of steel tube and steel angles. The rear drop frame shall be constructed using vertical drop tubes, welded to the main sub frame. All drop frame structures shall be welded directly to the body sub frame to allow the body to be a completely separate structure from the chassis.		
E	After fabrication the sub frame shall be hot dip galvanized for maximum protection against corrosion.		
459.	<u>BODY MOUNTING</u>		
A	The body sub frame shall be fastened to the chassis frame with a minimum of six (6) spring loaded body mounts. Each mount shall be configured using a two-piece bracket. The two (2) brackets shall be fabricated of steel plates. The plates shall be painted to prevent any corrosion. Each mounting assembly shall utilize two (2) plated bolts and two (2) heavy duty springs. The assembly design shall allow the body and sub frame to act as one (1) component, separate from the chassis. As the chassis frame twists under driving conditions, the spring mounting system shall limit any stress from being transferred into the body. The spring loaded body mounts shall also prevent frame side rail or body damage caused by unevenly distributed stress and strains due to load and chassis movement.		
B	Body mountings that does not allow relief from chassis movement shall not be acceptable.		
460.	<u>LEFT SIDE COMPARTMENTS</u>		
	COMPARTMENT L1		
	There shall be a full height compartment located ahead of the rear wheels on the left side of the apparatus body. This compartment shall be designated as L1 within these specifications and any ensuing paperwork or drawings after contract execution. It shall be equipped with a roll-up door with LED lighting running entire vertical length.		
	Door Opening - 41" Wide x 60" High		
	The compartment shall have a usable depth of 25.75" in the lower portion and 15.25" in the upper portion.		
	COMPARTMENT L2		
	There shall be an upper compartment located over the rear wheel on the left side of the apparatus body. This compartment shall be designated as L2 within these specifications and any ensuing paperwork or drawings after contract execution. The compartment shall be equipped with a roll-up door.		
	Door Opening - 28" Wide x 28" High		
	The compartment shall have a usable depth 15.25".		
	COMPARTMENT L3		
	There shall be a full height compartment located behind the rear wheels on the left side of the apparatus body. This compartment shall be designated as L3 within these specifications and any ensuing paperwork or drawings after contract execution. The compartment shall be equipped with a roll-up door.		
	Door Opening - 45" Wide x 60" High		
	The compartment shall have a usable depth of 15.25" in the upper portion and transverse in the lower portion.		
461.	<u>RIGHT SIDE COMPARTMENTS</u>		

	COMPARTMENT R1		
	There shall be a full height compartment located ahead of the rear wheels on the right side of the apparatus body. This compartment shall be designated as R1 within these specifications and any ensuing paperwork or drawings after contract execution. It shall be equipped with a roll-up door.		
	Door Opening - 41" Wide x 60" High		
	The compartment shall have a usable depth of 25.75" in the lower portion and 15.25" in the upper portion.		
	COMPARTMENT R2		
	There shall be an upper compartment located over the rear wheel on the right side of the apparatus body. This compartment shall be designated as R2 within these specifications and any ensuing paperwork or drawings after contract execution. It shall be equipped with a roll-up door.		
	Door Opening - 28" Wide x 28" High		
	The compartment shall have a usable depth of 15.25".		
	COMPARTMENT R3		
	There shall be a full height compartment located behind the rear wheels on the right side of the apparatus body. This compartment shall be designated as R3 within these specifications and any ensuing paperwork or drawings after contract execution. It shall be equipped with a roll-up door.		
	Door Opening - 45" Wide x 60" High		
	The compartment shall have a usable depth of 15.25" in the upper portion and transverse in the lower portion.		
462.	<u>TRANSVERSE REAR COMPARMENTS</u>		
	The rear lower compartment shall be transverse from the left side of the body to the right side of the body.		
463.	<u>REAR COMPARTMENT</u>		
	There shall be a full height compartment located at the rear of the apparatus body. This compartment shall be designated as T1 within these specifications and any ensuing paperwork or drawings after contract execution. It shall be equipped with a roll-up door.		
	Door Opening - 43" Wide x 26" High		
	The compartment shall have a usable depth of 32".		
464.	<u>COMPARTMENT LIGHTING</u>		
	All body compartments will have ROM LED lighting on both sides of each door running vertically.		
465.	<u>SWEEP-OUT CONSTRUCTION</u>		
	Compartment floors shall have a "sweep-out" design with door opening threshold positioned lower than compartment floor, permitting easy cleaning of compartments.		
466.	<u>ROLL-UP DOORS</u>		
	Roll-up doors shall be ROM shutter type with 34 millimeter slats that roll onto a spool at the top of the compartment. Each slat shall be equipped with nylon end shoes to assure operation without the need of constant lubrication.		

467.	<u>PAINTED ROM DOORS</u>		
A	The slats of the Robinson roll up doors shall be wet painted to match the apparatus body. The doors tracks and bottom sill shall also be painted to match the apparatus body.		
B	The roll up doors shall be painted by the door manufacturer. NO EXCEPTIONS		
468.	<u>ROBINSON ROLL UP DOOR HANDLES</u>		
	The roll-up door shall be supplied with a full width handle for ease of opening with only one hand, allowing quick access to equipment and Nylon end shoes on every slat to assure operation without constant lubrication		
469.	<u>NFPA STEP REQUIREMENTS</u>		
	All steps shall have a surface area of at least 35 square inches and shall be able to withstand a load of at least 500 pounds. Steps shall be provided at any area that personnel may need to climb and shall be adequately lighted.		
470.	<u>STEPS</u>		
A	All steps shall have a surface area of at least 35 square inches and shall be able to withstand a load of at least 500 pounds. Steps shall be provided at any area that personnel may need to climb and shall be adequately lighted. Each folding step shall have two large open slots to prevent buildup of ice or mud and to provide a handhold when necessary.		
B	Steps shall be provided in the following locations:		
	<ul style="list-style-type: none"> • Three (3) folding steps on the left front compartment 		
	<ul style="list-style-type: none"> • Three (3) folding steps on the right front compartment 		
	<ul style="list-style-type: none"> • Six (6) steps at the rear of the body, three (3) on each side. 		
C	NOTE: The exact number of steps provided may vary depending upon body configuration and options.		
471.	<u>FULL WIDTH HOSE BED STEP</u>		
A	There shall be a full width treadbrite step located above the rear compartment door. The step shall be used to assist in reloading the hose bed since it is covered with treadbrite doors.		
B	This step will be located between the discharges above the rear compartment doors.		
C	The handrail will be incorporated into the step.		
472.	<u>TOOL STORAGE IN REAR TRANSVERSE COMPARTMENT</u>		
A	Brackets shall be provided on the forward wall of the rear transverse compartment for long handle tools. Compartment shall be located behind the rear roller assembly on the rear center compartment. The compartment shall be suspended from the ceiling of the rear center compartment and be accessible from the right side rear compartment. The compartment shall only extend in depth to the back wall of the left rear compartment. There shall be a swing down hinged door provided on the inside of the right rear compartment for access.		
B	Storage area is to measure approximately - 22" wide x 10" high x 80" deep.		
C	Door shall hinge on the bottom side as to not interfere with the roll-up door.		
D	Install a 2" aluminum angle lip in this compartment, 50" door of the box on the R3 side to the angle.		

473.	<u>BACKBOARD STORAGE IN CENTER OF HOSE BED</u>		
A	A storage compartment shall be provided in the center of the hose bed to store one (1) backboard. The rear of this compartment shall have a hinged treadbrite door. Backboard is to be on top and pike poles and attic ladder on bottom of the storage compartment.		
B	Backboard is to be on top and pike poles and attic ladder on bottom of the storage compartment.		
474.	<u>PUMP COMPARTMENT HEAT PAN</u>		
A	There shall be a heat pan with a slide-in bottom panel installed beneath the pump compartment to contain the engine heat and prevent freezing of valves and plumbing in cold weather. The lower portion of the pump compartment area shall be enclosed on all sides, front, and rear. The slide-in panel shall be easily removable for warm weather operations.		
B	The heat pan shall be hot-dipped galvanized for added corrosion protection.		
475.	<u>RIGHT SIDE PUMP ACCESS DOOR</u>		
A	There shall be a treadbrite door above the right hand side pump panel to allow access to the pump compartment. The vertically hinged panel shall be of the single pan design and shall be positively latched in the closed position utilizing a pushbutton latch. A gas strut shall be provided on the door.		
B	This door shall be wired into the hazard warning light circuit. An aluminum sill protector shall be installed on the bottom of the door opening to protect the paint from chipping and scratching.		
476.	<u>PUMP ACCESS WITH DOOR</u>		
	There shall be a treadbrite access panel provided on the front of the pump compartment. The panel shall be of the single pan design and shall be positively latched in the closed position utilizing a pushbutton latch. An aluminum sill protector shall be installed on the bottom of the door opening to protect the paint from chipping and scratching.		
477.	<u>COMPARTMENT VENTING</u>		
A	Each body compartment shall be properly vented in a manner that will reduce the amount of dirt and water that may enter the compartment. Venting shall be directly to the atmosphere rather than into another compartment, which would only spread moisture throughout the body rather than dissipate it.		
B	Additionally, each compartment shall be equipped with drain holes to allow standing water to exit.		
478.	<u>HEAT DEFLECTOR SHIELD</u>		
	Increased standards for emission have caused most exhaust temperatures to increase. To keep the exhaust heat from affecting anything stored in the body, a deflector shield shall be provided to aid in dissipating the heat.		
479.	<u>LEFT MODULAR GRIP STRUT RUNNING BOARD</u>		
A	A grip strut running board shall be installed on the left side of the pump compartment module. The outside edge of the running board shall be flush with the rub rail that is installed on the body to maintain a uniform appearance.		
B	All running boards shall be installed with sufficient support to form a sturdy, non-deflecting step area for personnel.		
480.	<u>RIGHT MODULAR GRIP STRUT RUNNING BOARD</u>		
A	A grip strut running board shall be installed on the right side of the pump compartment module. The outside edge of the running board shall be flush with the rub rail that is installed on the body to maintain a uniform appearance.		

B	All running boards shall be installed with sufficient support to form a sturdy, non-deflecting step area for personnel.		
481.	<u>REAR MODULAR GRIP STRUT REAR STEP</u>		
A	A grip strut running board shall be installed on the rear of the apparatus to form a full width step area. The ends of the running board shall be flush with the rub rail that is installed on the body to maintain a uniform appearance.		
B	All running boards shall be installed with sufficient support to form a sturdy, non-deflecting step area for personnel.		
482.	<u>MODULAR REAR DECK</u>		
A	A modular bolt-on deck shall be installed on the rear of the apparatus to form a full width step area. The rear deck shall be constructed of non-slip treadbrite. The outside edge of the rear deck shall be flush with the rub rail that is installed on the body to maintain a uniform appearance.		
B	All running boards shall be installed with sufficient support to form a sturdy, non-deflecting step area for personnel.		
483.	<u>RUNNING BOARD HOSE COMPARTMENT - LEFT</u>		
A	There shall be soft suction hose compartment recessed in the running board on the left side. The floor of this compartment shall be covered with Dri-Dek flooring.		
B	There shall be an aluminum treadbrite cover installed on the running board hose compartment. The lid shall be equipped with a hinge on the backside. A gas strut shall be provided to hold the lid in the open position.		
484.	<u>ULTRA STAINLESS™ MARUTEX® SCREWS</u>		
A	Stainless steel screws shall be provided throughout the body in locations such as: overlays, pump panels, and other numerous hardware mounting locations. In these locations the following screw specification shall apply.		
B	The special ingredient in Ultra Stainless™ is Marutex®, which adds 2% molybdenum (moly) to 410 stainless. Moly is the significant component of 316 stainless that provides extra corrosion resistance. The moly is now added to 410 self-drilling screws to produce Ultra Stainless™. This combination provides for unprecedented corrosion resistance combined with hardness for drilling.		
C	Marutex® screws are tempered and quenched; regular T-140 self-drilling screws are case hardened. The additional carbon in Marutex® provides hardness for better drilling.		
D	In certified testing the Marutex® screws have shown far superior corrosion resistance than that of 410 stainless, and 304 Bimetal screws. The screws were tested using two methods, the first was a 500 hour salt spray test, and the second was the European Air Pollution Test using the Kesterich method. In this test a combination of condensation water and atmosphere containing sulfur dioxide was sprayed on the screws. In both tests the Marutex® screws did not show any signs of rust, the 410 and 304 samples on the other hand did.		
E	As part of quality control standards, samples from each batch of Ultra Stainless™ Marutex® screws shall be subject to a salt spray test for a minimum of 2500 hours. The test results shall be provided at any time upon request by the customer.		
485.	<u>STEPPING, STANDING, WALKING SURFACES</u>		
A	All exterior surfaces designated by the manufacturer as stepping, standing, or walking areas shall be constructed of Grip Strut or Textured Treadbrite and shall provide a highly slip resistant surface, even when the surface is wet. All interior surfaces designated by the manufacturer as stepping, standing, or walking areas shall be slip resistant when the surface is dry.		
B	The degree of slip resistance shall be in compliance with the intent of NFPA 1901 newest version.		

C	It is the desire of the fire department to purchase an apparatus that utilizes aluminum treadplate as an overlay of the main apparatus body structure. Aluminum treadplate may also be utilized in the construction of enclosure doors, lids and covers where applicable. Aluminum treadplate is not to be utilized as a main structural member of the apparatus body or pump enclosure.		
486.	<u>TREADPLATE OVERLAYS</u>		
A	Aluminum treadbrite plate overlays shall be sprayed with a clear coat sealer on backside that is pliable and resistant to scratches and chips to provide an insulating barrier between dissimilar metals when it is bolted to the body. After painting and final construction, overlays shall be additionally sealed at the edges with a caulking compound. Overlays shall be installed that are totally insulated from the overlay with nylon shoulder washers that extend into the hole that is drilled into the aluminum. Stainless steel cap nuts shall be employed where bolts may damage equipment or cause injury.		
B	Overlays shall be installed that are totally insulated from the overlay with nylon shoulder washers that extend into the hole that is drilled into the aluminum. Stainless steel cap nuts shall be employed where bolts may damage equipment or cause injury.		
C	The following areas shall have treadplate overlays installed:		
	<ul style="list-style-type: none"> • Front compartment vertical areas on both sides. 		
	<ul style="list-style-type: none"> • The top surface of all side compartments, bending over the edge and then bending out, forming a drip rail. 		
	<ul style="list-style-type: none"> • The rear surface of the body module between the rear compartment and the vertical handrail. 		
	<ul style="list-style-type: none"> • The rear surface of the body module above the rear compartment extending in width between the hose bed risers. 		
487.	<u>REAR WHEEL WELLS</u>		
	The fenders shall be integral with the body sides and compartments with a seamless appearance. The fenders shall be fitted with bolt-in removable full circular inner liners in the wheel well area for ease of cleaning and maintenance. There shall be sufficient clearance provided in the wheel well to allow the use of tire chains when the apparatus fully loaded.		
488.	<u>REAR FENDERETTES</u>		
	Two (2) stainless steel fenderettes shall be installed at the outboard edge of the rear wheel well area, one on each side. The fenderettes shall be bolted to the apparatus body using nylon washers to space them slightly away from the body to reduce build-up of road grime. The fenderettes shall be constructed of stainless steel that has been polished to a high quality finish.		
489.	<u>BODY RUB RAILS</u>		
A	Rub rails shall be installed beneath the compartment doors to protect them from damage should the body be brushed or rubbed against another object. The rub rails shall be 3/16 inch aluminum channel, 2-1/2 inch x 1 inch. The rub rails shall be highly polished and then Bright Dip anodized.		
B	It shall be installed on the body utilizing non-corrosive nylon spacers and secured with stainless steel bolts. The outside edge of the rub rails shall be even with the fenderettes and bolt-on steps to prevent snagging.		
490.	<u>REAR TOW EYE</u>		
	One (1) rear tow eyes shall be installed directly below the rear of the chassis frame rails. The tow eye shall be capable of a 15,000 lb. straight pull rating.		
491.	<u>HANDRAILS</u>		

A	Handrails shall be constructed of ribbed extruded aluminum of not less than 1-1/4" in diameter. All railing escutcheons and brackets shall be chrome plated, and shall be bolted to the body with stainless steel bolts. The lower bracket on all vertical handrails shall have a drain hole drilled in it at the lowest point. Handrails shall be provided in the following areas:		
	<ul style="list-style-type: none"> • Horizontal rear hand rail above the rear center compartment. 		
	<ul style="list-style-type: none"> • Grab handle on top of catwalk on the left side of the apparatus in front of the tank fill tower. 		
	<ul style="list-style-type: none"> • Grab handle on top of catwalk on the right side of the apparatus. 		
	<ul style="list-style-type: none"> • Left rear vertical hand rail from top of body to just above the rear step. 		
	<ul style="list-style-type: none"> • Right rear vertical hand rail from top of body to just above the rear step. 		
492.	<u>HYDRAULIC LADDER RACK- LEFT</u>		
A	The ladders shall be mounted above the high compartments on the left side of the apparatus on a pivoting ladder rack. The pivoting ladder rack shall be operated hydraulically and controlled by electric solenoid valves, lowering the ladders firmly to shoulder height for easy removal and reloading.		
B	The control switch shall be located on the left side of the body to allow viewing the ladder rack when operating the mechanism. The control shall be wired to the parking brake and shall only be operable when the parking brake is applied.		
C	The ladder rack shall modular in design and built in a "T" shape pivoting on a 20 inch wide arm. The module shall be located between the high side compartments. There shall be no guide arms or stabilizer arms located on the ends of the folding ladder rack. The right side compartments shall be accessible when the ladder rack is in either the up or down position.		
D	When in the up position the ladder rack lifting mechanism shall be fully retracted into the apparatus body and is flush with the side of the apparatus. Pilot operated check valves shall be installed in the hydraulic system to lock the rack in the stored position by maintaining pressure on the hydraulic cylinder.		
E	There shall be a master shut off switch and a flashing indicator light on the chassis dash to warn the driver when the ladder rack is in the down position, or in motion when the chassis parking brake is disengaged. The warning light shall be operative regardless of the position of the master switch.		
F	Reflective striping shall be applied to the ladder rack assembly in a manner that will readily indicate a hazard or obstruction to personnel.		
G	In addition to the reflective striping, Whelen 500 series LED lights shall be affixed to the front and rear of the ladder rack. These lights shall automatically become energized any time the ladder rack is not fully bedded.		
493.	<u>LADDER RACK SHIELD</u>		
	There shall be a shield installed on the hydraulic ladder rack. The shield shall protect the lifting mechanism of the ladder rack when in the up and stored position. The shield shall be painted to match the body. The upper portion of the shield shall have a treadbrite header.		
494.	<u>GROUND LADDERS</u>		
A	The ground ladder brackets shall have quick release spring loaded latches. The holding mechanism shall have be designed to clamp the ladders at two separate areas. This provision shall allow the sectional ladder to still be clamped into position when the roof ladder has been removed. All ladders will include rung guards.		
	<ul style="list-style-type: none"> • One (1) 22' folding ladder, Little Giant model 22 #10103 Installed in a treadbrite box located on the left side ladder rack. 		
	<ul style="list-style-type: none"> • One (1) 24' Two section extension ladder(s), Duo Safety 900A 		
495.	<u>HARD SUCTION HOSE "V" TROUGH</u>		

	There shall be one (1) hard suction hose "V" trough located on the left side ladder rack with the capacity to store one (1) 12' section of hard suction hose. The trough shall be fabricated of aluminum plate. Velcro straps shall be supplied to hold the hard suction hose secure.		
496.	<u>HYDRAULIC LADDER RACK</u>		
A	The ladders shall be mounted above the high compartments on the right side of the apparatus on a pivoting ladder rack. The pivoting ladder rack shall be operated hydraulically and controlled by electric solenoid valves, lowering the ladders firmly to shoulder height for easy removal and reloading.		
B	The control switch shall be located on the right side of the body to allow viewing the ladder rack when operating the mechanism. The control shall be wired to the parking brake and shall only be operable when the parking brake is applied.		
C	The ladder rack shall modular in design and built in a "T" shape pivoting on a 20 inch wide arm. The module shall be located between the high side compartments. There shall be no guide arms or stabilizer arms located on the ends of the folding ladder rack. The right side compartments shall be accessible when the ladder rack is in either the up or down position.		
D	When in the up position the ladder rack lifting mechanism shall be fully retracted into the apparatus body and is flush with the side of the apparatus. Pilot operated check valves shall be installed in the hydraulic system to lock the rack in the stored position by maintaining pressure on the hydraulic cylinder.		
E	There shall be a master shut off switch and a flashing indicator light on the chassis dash to warn the driver when the ladder rack is in the down position, or in motion when the chassis parking brake is disengaged. The warning light shall be operative regardless of the position of the master switch.		
F	Reflective striping shall be applied to the ladder rack assembly in a manner that will readily indicate a hazard or obstruction to personnel. In addition to the reflective striping, flashing lights shall be affixed to the front and rear and shall automatically become energized any time the ladder rack is not fully bedded.		
497.	<u>LADDER RACK SHIELD</u>		
	There shall be a shield installed on the hydraulic ladder rack. The shield shall protect the lifting mechanism of the ladder rack when in the up and stored position. The shield shall be painted to match the body. The upper portion of the shield shall have a treadbrite header.		
498.	<u>GROUND LADDERS</u>		
A	The ground ladder brackets shall have quick release spring loaded latches. The holding mechanism shall have be designed to clamp the ladders at two separate areas. This provision shall allow the sectional ladder to still be clamped into position when the roof ladder has been removed. All ladders will have rung guards.		
	<ul style="list-style-type: none"> • One (1) 16' roof ladder(s), Duo Safety 875A • One (1) 35' Three section extension ladder(s), Duo Safety 1225A 		
B	Need to add rung guards to ladders.		
499.	<u>HARD SUCTION HOSE "V" TROUGH</u>		
	There shall be one (1) hard suction hose "V" trough located on the right side ladder rack with the capacity to store one (1) 10' section of hard suction hose. The trough shall be fabricated of aluminum plate. Velcro straps shall be supplied to hold the hard suction hose secure.		

500.	<u>DRI-DEK TILES</u>		
A	There shall be Dri-Dek tiles provided with the apparatus. The tiles shall be black in color. When installed in compartments, yellow leading edges shall be provided. The tiles shall be installed as follows:		
	<ul style="list-style-type: none"> • Compartments: Seven (7) 		
	<ul style="list-style-type: none"> • Shelves in Compartments: Eight (8) 		
	<ul style="list-style-type: none"> • Trays in Compartments: One (1) 		
501.	<u>SHELVING CHANNELS</u>		
A	There shall be two Strut channels installed in two (2) standard height compartment(s) for future shelves		
B	The strut channels shall be installed in L2 and R2.		
C	There shall be two Strut channels installed in four (4) full height compartment(s) for future shelves.		
D	The strut channels shall be installed in L1, L3, R1 and R3.		
502.	<u>ADJUSTABLE SHELVES</u>		
A	There shall be eight (8) adjustable shelves constructed of 3/16" aluminum sheet with 2" lips. The shelves shall be coated with Line-X™, a thermoplastic polyurethane coating. The shelves shall be fabricated in such a manner that liquids readily drain when spilled.		
B	The shelves shall be installed 1-L1 lower, 1-L2, 2-L3 upper, 2-R1 upper, 1-R2, 1-R3 upper.		
503.	<u>PERMANENT SHELVES</u>		
A	There shall be one (1) permanent shelves installed on the apparatus. The shelves shall be constructed of heavy gauge aluminum sheet. The tray(s) shall be coated with Line-X™, a thermoplastic polyurethane coating.		
B	The permanent shelf shall be located in compartment L3.		
504.	<u>ROLL OUT EQUIPMENT TRAY(S)</u>		
A	There shall be one (1) rollout tray(s) installed on the apparatus. Each tray shall be provided with a SlideMaster™, roller type assembly. The roller assembly shall have a rated capacity of 150lb end load, 300lb distributed load, and shall have 100% extension capabilities. A mechanical lock assembly shall be provided to lock the tray in the extended position and the retracted position. The tray(s) shall be constructed of 3/16" aluminum sheet with 3" lips. The tray(s) shall be coated with Line-X™, a thermoplastic polyurethane coating.		
B	The tray roller assembly shall have a power coated finish for added corrosion protection.		
C	The roll-out trays shall be installed in L3 compartment.		
505.	<u>PLYWOOD LINING(S)</u>		
A	There shall be three (3) sheet(s) of marine grade plywood installed on the back wall of three (3) compartment(s). The plywood shall be spaced away from the back wall of the compartment with unistrut channels. Plywood shall be easily removed to mount equipment brackets. The plywood shall be finish sanded and varnished for protection.		
B	The plywood on the back wall shall be installed on the rear walls of compartments L1, L3, and R2.		
506.	<u>FIRE EXTINGUISHER STORAGE</u>		
	There shall be three (3) 6" PVC tubes for the storage of fire extinguishers. The tube rack(s) shall be located in a compartment to be determined.		

507.	<u>AIR BOTTLE COMPARTMENTS</u>		
	There shall be four (4) single cylinder air bottle compartments installed in the rear wheel well area. The tubes shall be constructed from injection molded plastic to reduce damage to the air cylinders. There shall be a drain hole in the rear of the compartment.		
508.	<u>AIR BOTTLE COMPARTMENT DOORS (O-RING GASKETS)</u>		
A	The single air bottle compartment shall have a Cast Products hinged door with an o-ring gasket.		
B	Compartment to be located one (1), left side and two (2), on the right.		
509.	<u>SINGLE BOTTLE CAST DOORS - PAINT JOB COLOR</u>		
	The single bottle cast doors shall be painted job color, same as the body. The door frame shall have a polished aluminum finish that is provided from Cast Products.		
510.	<u>FAN & SAW MOUNTING</u>		
A	There shall be provisions for the mounting of a customer supplied fan and saw in a compartment to be specified.		
B	Mount Fan in the roll-out tray on the right side in L3.		
C	PPV Fan to be positively latched to the roll-out tray to keep from bouncing around in the compartment.		
D	Install Chain Saw in a special bracket and bolt-on sleeve through the back wall of L3, on the left side of slide out tray that holds the fan.		
E	Install Pac-Trac Strap to hold the Chain Saw in place.		
F	Install an additional drain in L3 under the Chain Saw.		
511.	<u>HOSE BED CAPACITY</u>		
A	The hosebed shall be arranged to carry the following load from the driver's side to the right:		
	<ul style="list-style-type: none"> • One (1) double stacked loads of 1-3/4" hose (Pre-Connected) • One (1) double stacked load of 2-1/2" hose (Pre-Connected) • Storage for one (1) backboard • Three (3) stacks of 5" hose - 1000 feet • One (1) double stacked loads of 1-3/4" 100' Skid load with 300' of 3" hose below skid load • Remaining space below divide for 3" hose 		
512.	<u>HOSE BED</u>		
	The hose bed compartment shall have a minimum of 30 cubic feet of storage space in accordance with NFPA latest edition 1901.		
513.	<u>HOSE BED FLOORING</u>		
A	The floor of the hose bed compartment shall be constructed of Dura-Dek fiber reinforced plastic material. The flooring shall be fabricated of "T" beam pultrusions in parallel connected with cross slats that are first mechanically bonded and then epoxied, forming a large sheet.		
B	The top portion of each "T" cross section shall measure 1-1/4" wide and 3/16" thick with beaded ends. The vertical portion shall be 3/8" thick, beading out at the bottom to a thickness of 1/2" and tall enough to result in an overall height of 1". The "T" sections shall be spaced 3/4" apart to allow for drainage and ventilation.		

C	Each "T" beam shall be constructed utilizing a core of 250,000 continuous glass fiber strands that are high in resistance to tension, compression and bending. An outer sheath consisting of a continuous strand mat to prevent lineal splitting and shipping shall surround the core. The sheath shall also serve to draw the protective resin to the bar surface. Both reinforcements shall be pulled through an isophthalic polyester resin, treated with antimony trioxide for fire resistance, to form a solid length.		
D	The flooring shall then be protected with a polyurethane coating to screen out ultraviolet rays. This bright white coating shall be baked on and shall provide a pleasing contrast when installed in the apparatus.		
514.	<u>ALUMINUM HOSE BED PARTITION(S)</u>		
A	Three (3) hose bed partition(s) shall be installed in the hose bed. The partition(s) shall be fabricated from 1/4" smooth aluminum plate and an aluminum extrusion.		
B	The partition(s) shall be mounted on hot-dipped galvanized slide rails at the front and rear of the hose bed.		
C	Where no obstruction such as a fill tower is present, the slide rails shall allow full movement of a hose partition along the width of the hose bed. This shall provide the capability for variable hose load configurations & capacities.		
515.	<u>ABRADED FINISH HOSE BED DIVIDER</u>		
A	Three (3) adjustable hose bed divider(s) shall have a maintenance free abraded finish.		
B	There shall be cutouts provided at the rear of the hose bed dividers to be used as handles when climbing onto truck.		
516.	<u>VINYL HOSE BED COVER</u>		
A	There shall be a heavy duty vinyl coated nylon hose bed cover installed on the apparatus. The front edge of the cover shall be retained in a "C" channel to prevent wind from lifting it.		
B	The cover shall be fastened at the sides with shock cord and shall the rear flap shall be secured with quick release clips. The cover shall be red in color.		
517.	<u>HORIZONTALLY SPLIT HOSE STORAGE AREA(S)</u>		
A	There shall be four (4) horizontally split hose storage area(s) installed between the hose bed sidewall and a hose bed divider. The split hose storage area(s) shall allow for storage of two (2) preconnected lines at the rear of the apparatus. The horizontal divider shall be constructed of 3/16" aluminum that is slotted for drainage. The divide shall be hinged to allow for ease in reloading hose.		
B	Horizontally split hose and tool storage area. There shall be two (2), horizontally split storage area installed between the hose bed sidewall and the hose bed divider on the driver's side. The split storage area shall allow for storage of long tools under the 1-3/4" pre-connects on the driver's side of the hose bed.		
C	The horizontal divider shall be constructed of 3/16" aluminum and engineered in such a way that the hose can drain but the drainage does not run onto the long tools.		
D	Horizontal hose divider installed on the passenger side of the hose bed. The divider will separate the skid load from an unspecified amount of 3" hose. This divider will be designed to swing up for loading the hose under it. A latching mechanism will also be in place for holding the divider up when loading hose under it.		

518.	<u>WIRING HARNESESSES</u>		
A	Wiring harnesses shall be the automotive type, engineered specifically for the builder's apparatus, and shall meet the following criteria. Under no circumstances shall diodes, resistors, or fusible links be located within the wiring harness. All such components shall be located in an easy to access wiring junction box or the main circuit breaker area. All wire shall meet white book, baseline advanced design transit coach specification and Society of Automotive Engineers recommended practices. It shall be stranded copper wire core with cross linked polyethylene insulation complying with SAE specification J1128. Each wire shall be hot stamp function coded every three inches starting one inch from the end and continuing throughout the entire harness. In addition to function coding, each wire shall be number and color coded.		
B	All terminals on the ends of the wiring harness shall be soldered unless a crimping tool or machine is used that gives an even and precise pressure for the terminal being used. All terminals shall be pull tested to insure their integrity.		
519.	<u>12 VOLT ELECTRICAL PANEL</u>		
A	A main electrical panel shall be located in a highly weather resistant compartment. The panel shall contain a board with permanent sockets for relays, diode blocks, and automatic reset circuit breakers. The board shall be screwed to the compartment and shall have permanent leads, each one routed to a predetermined pin of the correct main bulkhead connector. The bulkhead connectors shall be physically attached to the box in such a way as to afford easy access to the connectors. The connectors shall be the Deutsch series with sealing plugs for any sockets not containing a wire. An "O" ring seal shall be an integral feature of the bulkhead connectors to eliminate the chance of water entering the connection and causing corrosion.		
B	A minimum of ten (10), spare circuit breaker sockets shall be supplied. All sockets and equipment shall be clearly labeled.		
C	Any circuit, which draws 15 nominal amperes shall be switched through relays. Individual loads shall be wired to individual circuit breakers as much as possible. The circuit breakers shall be sized for the individual load rather than selecting a large circuit breaker and ganging loads on until amperage rating of the circuit breaker is reached.		
D	The main electrical panel shall be fed by three harnesses, one for the cab, one for the pump compartment, and one main harness from the body. The main body harness shall be connected to individual compartment harnesses, for the left and right side of the body. Each main body harness shall be equipped with several spare wires from one end of the harness to the other. At any place where the harness or sub-harness passes through metal, heavy grommets shall be installed to protect it.		
520.	<u>12 VOLT SYSTEM SCHEMATIC</u>		
	A complete electrical schematic for the apparatus shall be provided. This schematic shall be specifically prepared for this individual unit rather than a generic schematic designed to accommodate all apparatus.		
521.	<u>12 VOLT SYSTEMS TEST</u>		
	After completion of the unit, the 12 volt electrical system shall undergo a battery of tests as listed in the latest addition of NFPA Pamphlet 1901. These tests shall include, but not be limited to: a reserve capacity test, alternator performance test at idle, alternator performance test at full load, and a low voltage alarm test. Certification of the results shall be supplied with the apparatus at the time of delivery.		

522.	<u>REAR WORK LIGHT SWITCH</u>		
	A switch shall be installed above the tail light bezel on the left side. The switch shall be wired to the backup lights to provide additional work lighting. The rear work light circuit shall be deactivated when the park brake is disengaged.		
523.	<u>MIDSHIP TURN SIGNAL (LED)</u>		
	There shall be one (1) Truck-Lite model 21LED midship auxiliary / turn signal lights installed in the rub rail, on each side of the body.		
524.	<u>LED CLEARANCE LIGHTS</u>		
	Truck-Lite model 30 LED clearance lights shall be installed on the rear of the body as necessary to be in full compliance with applicable ICC and DOT codes and regulations.		
525.	<u>GROUND LIGHTING</u>		
	Truck-Lite model 40 lights shall be installed beneath the apparatus in areas where personnel may be expected to climb on and off of the apparatus. The lights shall illuminate the ground within 30" of the apparatus to provide visibility of any obstructions or hazards. These areas shall include, but not be limited to, cab doors, side running boards, and the rear step area.		
526.	<u>WALKWAY LIGHTS</u>		
	Lights shall be mounted in a manner that illuminates all walkways and steps for safe operation of the apparatus. These lights shall become illuminated when the parking brake is engaged.		
527.	<u>SIGTRONIC US-67S INTERCOM</u>		
A	There shall be a Sigtronics US-67S intercom system supplied and installed on the apparatus. The system shall have the following capabilities:		
	• Drivers Position Intercom / PTT		
	• Officers Position Intercom / PTT		
	• Four (4) Crew Positions Intercom		
	• Pump Panel Intercom / PTT		
B	The following accessories shall be provided: One (1) radio adapter interface, if recommended and available from manufacturer, six (6) SE-8 headsets, and one (1) pump panel extension cable.		
C	Specify brand and model of radio for interface		
528.	<u>"ROM" LED COMPARTMENT LIGHTING</u>		
A	All high side compartments shall be furnished with a "ROM" LED compartment light mounted on the front corner of the compartment. An automatic door switch shall activate these compartment lights.		
B	All full height compartments shall be equipped with a "ROM" LED compartment light mounted on the front corner of the compartment. An automatic door switch shall activate these compartment lights.		
C	All compartments that have a door opening larger than 42" wide shall have a "ROM" LED compartment light installed on the front and rear corner of the compartment.		
D	Further, lighting shall be installed in any compartment or enclosed, equipment area with four cubic feet of storage capacity or greater, or any compartment with a door opening of 144 square inches or more.		
529.	<u>PUMP COMPARTMENT LIGHTS</u>		
	There shall be two (2) light(s) installed in the pump compartment. The light(s) shall be activated by an automatic switch in the right side pump compartment access door and shall be located in a manner that will provide maximum lighting.		
530.	<u>TAIL LIGHTS</u>		

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	There shall be two (2) Whelen 600 series LED tail light assemblies installed on the rear of the apparatus. Two (2) red LED stop/tail lights, two (2) amber LED turn lights, and two (2) clear back up lights shall be supplied. The lights shall be mounted in a cast housing, on each side of the apparatus.		
531.	<u>12 VOLT POWER LEAD</u>		
A	There shall be one (1)12 volt power leads provided at the MDT cutout on chassis dash. The power leads shall terminate at a terminal block located in the compartment. A minimum of a 20 amp breaker shall be provided with each power circuit.		
B	The 12 volt terminal blocks location to be determined at the pre-construction meeting.		
532.	<u>12 VOLT ACCESSORY OUTLET IN A COMPARTMENT</u>		
A	There shall be one (1)12 volt accessory outlet provided in a compartment.		
B	The outlet location shall be determined at the pre-construction meeting.		
533.	<u>STREAMLIGHT RECHARGEABLE LIGHTS</u>		
A	There shall be four (4) Streamlight "Survivor" high intensity rechargeable flashlights supplied and installed on the apparatus. The lights shall be wired direct to the chassis batteries.		
B	The lights location shall be determined at the pre-construction meeting.		
534.	<u>WHELEN RECHARGEABLE LIGHTS</u>		
A	There shall be three (3) Whelen LiFe LED rechargeable Lights supplied and installed on the apparatus. The lights shall be wired direct to the chassis batteries.		
B	The lights location shall be determined at the pre-construction meeting.		
535.	<u>CUSTOMER SUPPLIED RADIO ANTENNA</u>		
	There shall be two (2) customer supplied radio antenna(s) shipped to the manufacturer for installation.		
536.	<u>CUSTOMER SUPPLIED RADIO AND ANTENNA</u>		
	There shall be one (1) customer supplied radio(s) and one (1) customer supplied antenna(s) shipped to the manufacturer for installation.		
537.	<u>HOSE LOADING LIGHTS</u>		
	There shall be two (2) Unity AG-R deck lights mounted high at the rear of the apparatus. These lights shall be energized by a switch located directly on the lamp heads.		
538.	<u>ONAN HYDRAULIC GENERATOR SET</u>		
A	An Onan model CMHG 10000, hydraulic driven generator set shall be installed on the apparatus. The generator shall be rated at 10,000 watts at 120/240 volts. Current frequency shall be stable at 60 hertz.		
B	The power generating unit shall be modular unit, housed in stainless steel with an acoustical material added for maximum sound dampening. The module shall consist of the hydraulic motor, generator, blower, cooler, and all other necessary components.		
C	For ease of maintenance, the only part of the system that shall require accessibility shall be the oil reservoir which shall be located as to facilitate periodic checks and the adding of hydraulic fluids.		
539.	<u>WARRANTY PERIOD</u>		
A	Provided such goods are operated and maintained in accordance with Onan's written instructions, Onan warrants that the CMHG SERIES Hydraulic Generators shall be free from defects in material and workmanship for a period of five (5) years or one thousand (1,000) hours, whichever comes first, from the date of delivery to the first purchaser.		
B	Repair or replacement parts shall be warranted for ninety (90) days from date of purchase, excluding labor and travel expenses. Any part repaired or replaced during the warranty period		

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	assumes the remainder of the warranty or ninety (90) days, whichever is greater.		
C	Onan shall pay for the parts and labor, including diagnostic labor, to repair the generator. When necessary, Onan shall also pay reasonable labor expenses associated with the removal and reinstallation of the generator into the customer's equipment, up to the maximum time of two (2) hours. For the first two (2) years of coverage, Onan shall pay travel time up to two and one-half (2.5) hours and mileage cost up to one hundred (100) miles, if such work is done by an Onan distributor or other service representative designated by Onan.		
D	The generator shall be located in dunnage compartment above the water pump.		
540.	<u>GENERATOR HOT SHIFT PTO CONNECTION</u>		
	The hydraulic pump for the generator system shall be connected to the chassis transmission through a "Hot Shift", electrically engaged power-take-off system. The control to engage and disengage the power-take-off system shall be installed in the chassis cab.		
541.	<u>FROG DISPLAY</u>		
A	There shall be a FROG D provided with the generator. The FROG D shall automatically sense a generator signal and begin displaying information. The digital meter display shall constantly monitor and display Voltage, Frequency (accurate to within 1 decimal point), and Current Draw on two separate lines. The display shall be capable of displaying total accumulated run time hours when the MODE button is pressed. This information shall be stored in a non-erasable memory.		
B	The frog display shall be located on the pump panel.		
542.	<u>LOAD CENTER</u>		
A	The entire 120/240 volt electrical system shall be installed in strict compliance with NFPA Pamphlet 1901, newest edition. This shall include all testing, labeling, wiring methodology, and dimensional requirements. Certification of compliance shall accompany the apparatus at the time of delivery.		
B	There shall be a 120/240 volt load center incorporated into the 120/240 volt wiring system. The load center shall include adequate circuit breakers to protect the loads specified on this apparatus.		
C	All 120/240 volt A.C. Wiring shall be done in accordance with NFPA Pamphlet 1901 as well as nationally accepted electrical codes.		
543.	<u>BRANCH CIRCUIT OVERCURRENT PROTECTION</u>		
A	Overcurrent protection devices shall be provided for circuits in accordance with NFPA 1901 newest version. The load center shall be equipped with a non-GFI two pole main breaker when the six or more individual branch circuits are present.		
B	Overcurrent protection devices shall be marked with labels to identify the function of the circuit they protect.		
C	The load center shall be located in L1 compartment.		
D	There shall be a drip pan with drain provided in the upper section of the compartment. The drip pan shall prevent moisture from the roll-up door spool from coming in contact with the breaker box.		

544.	<u>CORD REEL JUNCTION BOX(ES)</u>		
A	There shall be one (1) Extenda-Lite model EJB-FP back lighted electrical junction box(es), equipped with two (2) Fire Power electrical receptacles, and two (2) household type receptacles. Each receptacle shall be equipped with a spring loaded snap cover. A cord reel shall be prewired to the cast aluminum junction box to supply power to the receptacles. An extension cord shall be connected to the junction box through a heavy duty water resistant strain relief and flexible extender. Each side of the junction box shall be fitted with polypropylene faceplates which are back lighted so that plug orientation to the receptacles is quick and easy to align.		
B	The junction box shall have an aluminum treadbrite mounting bracket with a velcro strap to secure the box.		
C	The junction box shall be hard wired to the cord reel.		
545.	<u>WHELEN FIXED 12 VOLT BROW LIGHT</u>		
A	There shall be one (1) Whelen model PFP2 light with a PBASPTM contoured roof mount light installed on the front of the chassis cab. The mounting brackets shall attach to the bottom of the lamp head and be machined to conform to the roof radius. Wiring shall extend from a weatherproof strain relief at the rear of the lamp head.		
B	Lamp head and brackets shall be powder coated white. The floodlight shall be UL listed as scene lights for fire service use.		
C	The non-telescopic lights shall be installed on the top of chassis front center.		
546.	<u>TELESCOPING LIGHT MOUNTS - REAR CAB WALL</u>		
	The following 120 volt telescoping lights shall be mounted to the rear of the cab.		
547.	<u>TRI-POD 120 VOLT LIGHTS</u>		
A	There shall be two (2) Whelen model PCP2D3 with an 8728302 tripod telescopic light provided with mounting collars. The light pole shall be anodized aluminum and have a knurled twist lock mechanism to secure the extension pole in position. The extension pole shall extend 40" and rotate 360 degrees. An internal brake shall slow the extension pole during lowering. The outer pole shall be a grooved aluminum extrusion. The floodlight shall be UL listed as a scene light for fire service use.		
B	The tri-pod / telescopic lights shall be installed one each side of the back of chassis cab.		
548.	<u>UPPER ZONE A VISUAL WARNING</u>		
A	There shall be one (1) Whelen Engineering model F4R7BCBR, 72" long light bar installed on the chassis cab roof. The lightbar shall be equipped with two (5) forward facing rotating LED's.		
B	The lightbar shall be equipped with clear lenses. All clear LEDs in the lightbar shall be deactivated in the Blocking Right of Way mode.		
549.	<u>UPPER ZONE C VISUAL WARNING</u>		
	There shall be two (2) Whelen Engineering model B6MMRRP Super LED beacons / LED installed high at the rear of the apparatus. The Super LED beacon shall have red lenses and the lower LED shall have red lenses.		
550.	<u>LOWER ZONE B VISUAL WARNING</u>		
	There shall be three (3) Whelen Engineering model 60R00F*R LED lights with flanges installed in the lower warning zone. The lights shall have a red lenses.		

551.	<u>LOWER ZONE C VISUAL WARNING</u>		
	There shall be two (2) Whelen Engineering model 60R00F*R LED lights with flanges installed in the lower warning zone. The lights shall have a red lenses.		
552.	<u>LOWER ZONE D VISUAL WARNING</u>		
	There shall be three (3) Whelen Engineering model 60R00F*R LED lights with flanges installed in the lower warning zone. The lights shall have a red lenses.		
553.	<u>AIR HORN BUTTON ON PUMP PANEL</u>		
	One (1) air horn button shall be provided on the pump panel.		
554.	<u>WHELEN "LED" TRAFFIC ADVISOR</u>		
	There shall be one (1) Whelen model TAL85 "LED" Traffic Advisor installed on the apparatus. The traffic advisor shall be recess mounted on the rear of the body above the rear compartment. A deluxe controller shall be supplied and installed in the cab to control the traffic advisor.		
555.	<u>THERMOPLASTIC COATING</u>		
A	In the designated areas, Line-X™, a two component spray-in-place thermoplastic polyurethane system shall be used for maximum protection of the body and equipment. The system shall utilize flexible 100% solids applied with high pressure impingement-mix polyurethane dispensing equipment.		
B	The coating shall be a fast cure, textured surface, multi-purpose material designed for commercial and industrial applications. It shall exhibit excellent adhesion to the body and serve as a protective, abrasion resistant liner where applied.		
C	The density of the material shall be a minimum of 70 PCF as measured using ASTM test method D-1622.		
D	The taber abrasion resistance shall be a minimum of 0.03% per 1000 cycles as measured utilizing ASTM test method D-4060.		
E	The minimum tensile strength as measured using ASTM D-2370 shall be 1540 pounds per square inch.		
556.	<u>BODY COMPARTMENTATION COATING</u>		
	The interior of the body compartments shall be coated with a gray thermo-plastic polyurethane coating. The coating shall be durable enough to withstand everyday abuse of equipment removal and shifting.		
557.	<u>BODY PAINT PREPARATION</u>		
A	After the body and components have been fabricated and assembled they shall then be disassembled prior to painting so when the apparatus is completed there shall be finish paint beneath the removable components. The body shall be totally removed from the chassis during the painting process to insure the entire unit is covered. The apparatus body and components shall be metal finished as follows to provide a superior substrate for painting.		
B	All aluminum sections of the body shall undergo a thorough cleaning process starting with a phosphoric acid solution to begin the etching process followed by a complete rinse. The next step shall consist of a chemical conversion coating applied to seal the metal substrate and become part of the aluminum surface for greater film adhesion.		
C	After the cleaning process the body and its components shall be primed with a High Solids primer and the seams shall be caulked.		
D	All bright metal fittings, if unavailable in stainless steel or polished aluminum, shall be heavily chrome plated. Iron fittings shall be copper under plated prior to chrome plating.		

558.	<u>PAINT PROCESS</u>		
A	The paint process shall follow the strict standards as set forth by PPG Fleet Finish Guidelines.		
B	The body shall go through a three-stage paint process: Primer Coat, Base Coat (Color), and Clear Coat. In the first stage of the paint process the body shall be coated with PPG F3980 Low VOC / High Solids primer to achieve a total thickness of 2-4 mills. In the second stage of the paint process the body shall be painted with PPG FBCH Delfleet™ High Solids Polyurethane Base Coat. A minimum of two to three coats of paint shall be applied to achieve hiding. In the final stage of the paint process the body shall be painted with PPG DCU-2002 Clear Coat. A minimum of two to three coats shall be applied to achieve a total dry film thickness of 2-3 mills.		
C	As part of the curing process the painted body shall go through a Force Dry / Bake Cycle process. The painted components shall be baked at 185 degrees for 3 hours to achieve a complete coating cure on the finished product.		
559.	<u>HAND POLISHED</u>		
	After the force dry / bake cycle and ample cool down time, the coated surface shall be sanded using 3M 1000, 1200, and or 1500 grit sandpaper to remove surface defects. In the final step, the surface shall be buffed with 3M Superduty compound to add extra shine to coated surface. No more than .5 mil of clear shall be removed in this process.		
560.	<u>PUMP COMPARTMENT - JOB COLOR</u>		
	The pump, valves, plumbing and interior of the pump compartment shall be painted with PPG polyurethane enamel paint. The paint shall be job color, same as the body.		
561.	<u>APPARATUS BODY COLOR</u>		
	The apparatus shall be painted with PPG High Solids Polyurethane Base Coat.		
	The apparatus shall be painted (RED) PPG# FBCH - 71096-ALT.		
562.	<u>TOUCH UP PAINT</u>		
	One (1) four ounce bottle of acrylic enamel touch-up paint shall be supplied.		
563.	<u>GOLD LEAF LETTERING</u>		
A	There shall be seventy (70) 22KT gold leaf letters provided and installed on the apparatus. The letters shall be approximately 3" tall with black outline and shadow.		
B	Lettering to be determined at the pre-construction meeting.		
564.	<u>REFLECTIVE LETTERING</u>		
A	There shall be eight (8) reflective letters provided and installed on the apparatus. The letters shall be approximately 6" tall with black outline and shadow.		
B	Lettering to be determined at the pre-construction meeting.		
565.	<u>REFLECTIVE LETTERING</u>		
A	There shall be four (4) reflective letters provided and installed on the apparatus. The letters shall be approximately 12" tall with black outline and shadow.		
B	Lettering to be determined at the pre-construction meeting.		
566.	<u>REFLECTIVE LETTERING</u>		
A	There shall be two (2) reflective letters provided and installed on the apparatus. The letters shall be approximately 22" tall.		
B	Lettering to be determined at the pre-construction meeting.		

567.	<u>NFPA COMPLIANT REFLECTIVE STRIPING</u>		
	Reflective striping shall be applied to the exterior of the apparatus in a manner consistent with the National Fire Protection Association Pamphlet 1901, latest edition. It shall consist of a straight, 4" wide stripe along the front of the chassis and along the sides, staying below the tops of the wheel well areas. A 6" wide stripe shall be applied across the rear of the apparatus. The reflective striping shall be white in color.		
568.	<u>RUB RAIL REFLECTIVE STRIPING</u>		
	There shall be 2" reflective striping installed in the rub rail channel. The reflective striping shall be diamond grade quality material for increased visibility. The reflective shall be silver in color.		
569.	<u>UNDERCOATING</u>		
A	The apparatus shall undergo a two (2) step undercoating process. The first step shall be a rubberized polyurethane base compound that is applied after the body has been primed. The materials used shall incorporate unused paint products to reduce the amount of waste released into the environment. This coat shall be applied to all hidden pockets and surfaces that shall not be visible after completion.		
B	As a final step, the entire underside of the body shall be coated with a bituminous based automotive type undercoating when the apparatus is completed. During this application, special care shall be taken to avoid spraying the product on air lines, cables, or other items that would cause normal maintenance to be hindered.		
570.	<u>MUD FLAPS</u>		
	Four (4) mud flaps shall be installed on the apparatus, two at the front and two at the rear. The mud flaps shall be a minimum of 3/8" thick to prevent "sailing".		
571.	<u>WHEEL CHOCKS & MOUNTING</u>		
	There shall be one (1) pair of Zico wheel chocks provided with the apparatus. The chocks shall be mounted brackets that are easily accessible under the left side body.		
572.	<u>ADDITIONAL HARDWARE</u>		
	There shall be one (1) bag(s) of stainless steel nuts, bolts, and washers supplied with the apparatus for mounting of equipment.		
573.	<u>PAC-TRAC HANDLELOK TOOL MOUNT</u>		
A	There shall be ten (10) Pac-Trac model 1004 handlelok tool mounting strap provided on the apparatus.		
B	The nozzle holder location shall be determined at the pre-construction meeting.		
574.	<u>AKRON MODEL 350 1-1/2" MOUNTING PLATE</u>		
A	There shall be ten (10) Akron model 350 1-1/2" mounting plate provided with the apparatus.		
B	The 1-1/2" mounting brackets shall be installed in locations to be determined at pre-paint.		
575.	<u>AKRON MODEL 350 2-1/2" MOUNTING PLATE</u>		
A	There shall be ten (10) Akron model 350 2-1/2" mounting plate provided with the apparatus.		
B	The 1-1/2" mounting brackets shall be installed in locations to be determined at pre-paint.		
576.	<u>SNAP-TITE 5" STORZ MOUNTING PLATE</u>		
A	There shall be ten (10) Snap-Tite 5" mounting plate provided with the apparatus.		
B	The 5" storz mounting brackets shall be installed in locations to be determined at pre-paint.		

577.	<u>FUEL FILL</u>		
	The fuel fill pocket shall be located in the left rear wheel well area. The fuel fill shall have a Cast Products aluminum door with bezel installed.		
578.	<u>FUEL FILL CAST DOOR - PAINT JOB COLOR</u>		
	The fuel fill cast door shall be painted job color, same as the body. The door frame shall have a polished aluminum finish that is provided from Cast Products.		
579.	<u>FUEL TANK GAUGE ACCESS PANEL</u>		
	There shall be a removable panel provided in the rear compartment to allow for access to the fuel tank gauge without removing the fuel tank.		
580.	<u>GROUND LIGHTING</u>		
	Lights shall be installed beneath the apparatus in areas where personnel may be expected to climb on and off of the apparatus. The lights shall illuminate the ground within 30" of the apparatus to provide visibility of any obstructions or hazards. These areas shall include, but not be limited to, cab doors, side running boards, and the rear step area.		
581.	<u>ROAD SAFETY KIT</u>		
	There shall be one (1) road safety kit provided with the apparatus. The kit shall consist of three (3) DOT approved reflective triangles.		
582.	<u>AIR INLET / OUTLET ON PUMP PANEL</u>		
	An air inlet / outlet shall be located on the left pump panel. This fitting shall be connected to the chassis air brake system. The air inlet/outlet shall include 25' of air line and a storage compartment.		
583.	<u>ALUMINUM MOUNTING PLATE</u>		
	There shall be a brushed aluminum plate installed on top of the engine compartment in the chassis between the driver and the officer. The plate shall be spaced approximately 1/2" to 1" from the engine tunnel surface to allow for mounting of equipment.		
584.	<u>MANUFACTURING LABELS</u>		
A	A permanent plate shall be mounted in the driver's compartment specifying the quantity and type of the following fluids that may be used in the apparatus for normal maintenance. Where a fluid is not applicable to the unit, the plate shall be marked N/A to inform the service technician who may not be familiar with the apparatus.		
	• Engine oil		
	• Engine coolant		
	• Transmission fluid		
	• Pump transmission fluid		
	• Pump primer fluid		
	• Drive axle fluid		
	• Air conditioning refrigerant		
	• Power steering fluid		
	• Cab tilt mechanism fluid		
	• Transfer case fluid		
	• Equipment rack fluid		
	• Air compressor system lubricant		
	• Generator system lubricant		
	• Front tires air pressure		
	• Rear tires air pressure		
B	A permanent plate shall be affixed in the driver's area that states the maximum number of personnel allowed to ride on the apparatus at any time.		

C	A sign shall be affixed in the chassis cab, in plain sight of the driver that states the overall travel height, overall length, and gross GVWR of the apparatus.		
D	On any gated inlet on the apparatus, a permanent label shall be provided that states: "WARNING: Death or serious injury might occur if proper operating procedures are not followed. The pump operator as well as individuals connecting supply or discharges hoses to the apparatus must be familiar with water hydraulics hazards and component limitations."		
E	All other appropriate labels to ensure safe operation of the apparatus shall be permanently affixed in conspicuous locations.		
585.	<u>ADDITIONAL EQUIPMENT SUPPLIED BY DEALER</u>		
	<ul style="list-style-type: none"> • Two (2), TFT AB3ST-NX 6"FNST x 5" Storz • Two (2), Kochek SKE54R 4" FNST rocker lug x 5" Storz 30 degree elbow • Two (2), Kochek CC507 5" blind cap with cable • One (1), Duo Safety 585-A 10' folding attic ladder • One (1), Duo Safety FP 6' fiberglass pike pole • One (1), Duo Safety FP 8' fiberglass pike pole • Two (2), Kochek 2P601 6" PVC suction hose • One (1), Kochek LL60 6" low level strainer with jet siphon and internal screen • One (1), 15# CO2 fire extinguisher • One (1), Ansul AA20 20# ABC fire extinguisher • One (1), Amerex 240 2.5 gallon water extinguisher • One (1), TFT XFC-42 Crossfire Monitor, Safe-Tak base (1), 5" Storz inlet, Quad stack tips, Haloring Master Stream 1250 nozzle and stream straightener. • One (1), TFT AFF-MPL flange mount 3" • One (1), Bullard QXT Imaging camera, direct temperature measurement, heat seeker, plus indicator with truck mount charger, one extra battery and a retractable lanyard. 		
586.	<u>WARRANTY</u>		
A	Summary of Warranty Terms: THE FOLLOWING IS SUMMARY OF WARRANTY TERMS FOR INFORMATION ONLY. THE ACTUAL LIMITED WARRANTY DOCUMENT, WHICH IS ATTACHED TO THIS OPTION, CONTAINS THE COMPLETE STATEMENT OF THE SPARTAN MOTORS USA LIMITED WARRANTY. SPARTAN'S RESPONSIBILITY IS TO BE ACCORDING TO THE TERMS OF THE COMPLETE LIMITED WARRANTY DOCUMENT.		
B	The chassis manufacturer shall provide a limited parts and labor warranty to the original purchaser of the custom built cab and chassis for a period of twenty-four (24) months, or the first 36,000 miles, whichever occurs first. The warranty period shall commence on the date the vehicle is delivered to the first end user.		
587.	<u>CHASSIS OPERATION MANUAL</u>		
	There shall be two (2) digital copies of the chassis operation manual provided with the chassis. The digital data shall include a parts list specific to the chassis model.		
588.	<u>ENGINE AND TRANSMISSION OPERATION MANUALS</u>		
	The following manuals specific to the engine and transmission models ordered will be included with the chassis in the ship loose items:		
	<ul style="list-style-type: none"> • (2) Hard copies of the Engine Operation and Maintenance manual with CD • (2) Digital copies of the Transmission Operator's manual 		

	<ul style="list-style-type: none"> (2) Digital copies of the Engine Owner’s manual 		
589.	<u>CAB/CHASSIS AS BUILT WIRING DIAGRAMS</u>		
	The cab and chassis shall include two (2) digital copies of wiring schematics and option wiring diagrams.		
590.	<u>DIAGNOSTIC SOFTWARE OCCUPANT PROTECTION</u>		
A	Diagnostic software for the Advanced Protection System shall be available for free download from the Spartan Chassis website to Spartan authorized OEMs, dealers and service centers, as well as the vehicle owner.		
B	The software has been validated to be compatible with the following RP1210 interface adapters: <ul style="list-style-type: none"> NexIQ™ USB-Link™ 		
C	The software and adapter utilize the SAE J1939-13 heavy duty nine (9) pin connector which is located below the driver’s side dash to the left of the steering column.		
591.	<u>THIS VEHICLE MUST BE DELIVERED BEFORE 12-31-2019</u>		

VI. Sedgwick County’s Responsibilities

- Provide information, as legally allowed, in possession of the County, which relates to the County’s requirements or which is relevant to this project.
- Designate a person to act as the County Contract Manager with respect to the work to be performed under this contract.
- Conduct final inspection and approve payment.

VII. Proposal Terms

A. Questions and Contact Information

Any questions regarding this document must be submitted in writing to Britt Rosencutter at britt.rosencutter@sedgwick.gov by **5:00 p.m. CDT Monday, March 19, 2018**. Any questions of a substantive nature will be answered in written form as an addendum and posted on the purchasing website at www.sedgwickcounty.org/finance/purchasing.asp, under view current RFQs and RFPs; to the right of the RFP number by **5:00 p.m. CDT Thursday March 22, 2018**. Firms are responsible for checking the website and acknowledging any addenda on their proposal response form.

B. Minimum Firm Qualifications

This section lists the criteria to be considered in evaluating the ability of firms interested in providing the service(s) and/or product(s) specified in this Request for Proposal. Firms must meet or exceed these qualifications to be considered for award. Any exceptions to the requirements listed should be clearly detailed in proposer’s response.

Proposers shall:

1. Have a minimum of 20 years’ experience in providing services similar to those specified in this RFP.
2. Have an understanding of industry standards and best practices.
3. Have experience in managing projects of comparable size and complexity to that being proposed.
4. Have knowledge of and comply with all currently applicable, and as they become enacted during the contract term, federal, state and local laws, statutes, ordinances, rules and regulations. All laws of the State of Kansas, whether substantive or procedural, shall apply to the contract, and all statutory, charter, and ordinance provisions that are applicable to public contracts in the county shall be followed with respect to the contract.

5. Municipal and county government experience is desired, however, the county will make the final determination based on responses received and the evaluation process.
6. Have the capacity to acquire all bonds, escrows or insurances as outlined in the terms of this RFP.
7. Provide project supervision (as required) and quality control procedures.
8. Have appropriate material, equipment and labor to perform specified services.
9. Park only in designated areas and display parking permit (if provided).
10. Wear company uniform or ID badge for identification purposes.

C. [Evaluation Criteria](#)

The selection process will be based on the responses to this RFP. County staff will judge each response as determined by the scoring criteria below. Purchasing staff are not a part of the evaluation committee.

Component	Points
A. Responsiveness to specification	40
B. Cost	25
C. Service and Technical Support	15
D. Replacement Parts Availability	15
E. Delivery Timeframe	5
Total Possible Points	100

Any final negotiations for services, terms and conditions will be based, in part, on the firm’s method of providing the service and the fee schedule achieved through discussions and agreement with the county’s review committee. The county is under no obligation to accept the lowest priced proposal and reserves the right to further negotiate services and costs that are proposed. The county also reserves the sole right to recommend for award the proposal and plan that it deems to be in its best interest.

The county reserves the right to reject all proposals. All proposals, including supporting documentation shall become the property of Sedgwick County. All costs incurred in the preparation of this proposal shall be the responsibility of the firm making the proposals. Sedgwick County reserves the right to select, and subsequently recommend for award, the proposed service which best meets its required needs, quality levels and budget constraints.

D. [Request for Proposal Timeline](#)

The following dates are provided for information purposes and are subject to change without notice. Contact the Division of Purchasing at (316) 660-7255 to confirm any and all dates.

Distribution of Request for Proposal to interested parties	March 15, 2018
Questions and clarifications submitted in writing by 5:00 p.m. CDT	March 19, 2018
Addendum Issued	March 22, 2018
Sealed Proposal due before 1:45pm CDT	April 3, 2018
Evaluation Period	April 3 – April 6, 2018
Board of Bids and Contracts Recommendation	April 12, 2018
Board of County Commission Award	April 18, 2018

E. [Contract Period and Payment Terms](#)

A contractual period will begin following Board of County Commissioners (BoCC) approval of the successful firm(s) and continue for a period of one (1) year.

Either party may cancel its obligations herein upon thirty-day (30) prior written notice to the other party. It is understood that funding may cease or be reduced at any time, and in the event that adequate funds are not available to meet the obligations hereunder, either party reserves the right to terminate this agreement upon thirty (30) days prior written notice to the other. Payment will be remitted following receipt of monthly detailed invoice.

Payment and Invoice Provisions

http://www.sedgwickcounty.org/purchasing/payment_and_invoice_provisions.pdf

F. [Insurance Requirements](#)

Liability insurance coverage indicated below must be considered as primary and not as excess insurance. Contractor shall furnish a certificate evidencing such coverage, with County listed as an additional insured, except for professional liability, workers' compensation and employer's liability. **Certificate shall be provided prior to award of contract.** Certificate shall remain in force during the duration of the project/services and will not be canceled, reduced, modified, limited, or restricted until thirty (30) days after County receives written notice of such change. All insurance must be with an insurance company with a minimum BEST rating of A-VIII and licensed to do business in the State of Kansas **(must be acknowledged on the bid/proposal response form).**

NOTE: If any insurance is subject to a deductible or self-insured retention, written disclosure must be included in your proposal response and also be noted on the certificate of insurance.

It is the responsibility of Contractor to require that any and all approved subcontractors meet the minimum insurance requirements. Contractor shall obtain the above referenced certificate(s) of insurance, and in accordance with this Agreement, provide copies of such certificates to County.

Workers' Compensation:

Applicable coverage per State Statutes

Employer's Liability Insurance: \$100,000.00

Commercial General Liability Insurance:

Each Occurrence \$500,000.00

Aggregate \$500,000.00

Personal Injury:

Each Occurrence \$500,000.00

General Aggregate \$500,000.00

Automobile Liability:

Combined single limit \$500,000.00

Professional Liability

If required

Special Risks or Circumstances:

Entity reserves the right to modify these requirements, including limits, based on the nature of the risk, prior experience, insurer, coverage, or other special circumstances.

G. Indemnification

To the fullest extent of the law, the provider, its subcontractor, agents, servants, officers or employees shall indemnify and hold harmless Sedgwick County, including, but not limited to, its elected and appointed officials, officers, employees and agents, from any and all claims brought by any person or entity whatsoever, arising from any act, error, or omission of the provider during the provider's performance of the agreement or any other agreements of the provider entered into by reason thereof. The provider shall indemnify and defend Sedgwick County, including, but not limited to, its elected and appointed officials, officers, employees and agents, with respect to any claim arising, or alleged to have arisen from negligence, and/or willful, wanton or reckless acts or omissions of the provider, its subcontractor, agents, servants, officers, or employees and any and all losses or liabilities resulting from any such claims, including, but not limited to, damage awards, costs and reasonable attorney's fees. This indemnification shall not be affected by any other portions of the agreement relating to insurance requirements. The provider agrees that it will procure and keep in force at all times at its own expense insurance in accordance with these specifications.

H. Confidential Matters and Data Ownership

The successful proposer agrees all data, records and information, which the proposer, its agents and employees, which is the subject of this proposal, obtain access, remains at all times exclusively the property of Sedgwick County. The successful proposer agrees all such data, records, plans and information constitutes at all times proprietary information of Sedgwick County. The successful proposer agrees that it will not disclose, provide, or make available any of such proprietary information in any form to any person or entity. In addition, the successful proposer agrees it will not use any names or addresses contained in such data, records, plans and information for the purpose of selling or offering for sale any property or service to any person or entity who resides at any address in such data. In addition, the successful proposer agrees it will not sell, give or otherwise make available to any person or entity any names or addresses contained in or derived from such data, records and information for the purpose of allowing such person to sell or offer for sale any property or service to any person or entity named in such data. Successful proposer agrees it will take all reasonable steps and the same protective precautions to protect Sedgwick County's proprietary information from disclosure to third parties as with successful proposer's own proprietary and confidential information. Proposer agrees that all data, regardless of form that is generated as a result of this Request for Proposal is the property of Sedgwick County.

I. Proposal Conditions

http://www.sedgwickcounty.org/purchasing/pdf_files/Proposal%20Terms%20%20Conditions.pdf

General Contract Provisions

http://www.sedgwickcounty.org/purchasing/pdf_files/General%20Contractual%20Provisions.pdf

Mandatory Contract Provisions

http://www.sedgwickcounty.org/purchasing/pdf_files/Mandatory%20Contractual%20Provisions.pdf

Sample Contract

http://www.sedgwickcounty.org/purchasing/pdf_files/Sample%20Contract.pdf

VIII. Required Response Content

All proposal submissions shall include the following:

1. Firm profile: the name of the firm, address, telephone number(s), contact person, year the firm was established, and the names of the principals of the firm.
2. The names of the staff members who will be available for work on the contract, including a listing of their work experience.

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Sedgwick County...working for you*

3. The firm's relevant experience, notably experience working with government agencies.
4. At minimum, three (3) professional references, besides Sedgwick County, with email addresses, telephone numbers, and contact persons where work has been completed within the last three years.
5. A disclosure of any personal or financial interest in any properties in the project area, or any real or potential conflicts of interest with members of the Sedgwick County Board of County Commissioners or County staff.
6. A description of the type of assistance that will be sought from County staff, including assistance required from the County to lessen the costs of this project.
7. Proof of insurance meeting minimum insurance requirements as designated herein.
8. Those responses that do not include all required forms/items may be deemed non-responsive.

IX. Response Form

**REQUEST FOR PROPOSAL
#18-0028
PUMPER TRUCK**

The undersigned, on behalf of the proposer, certifies that: (1) this offer is made without previous understanding, agreement or connection with any person, firm, or corporation submitting a proposal on the same project; (2) is in all respects fair and without collusion or fraud; (3) the person whose signature appears below is legally empowered to bind the firm in whose name the proposer is entered; (4) they have read the complete Request for Proposal and understands all provisions; (5) if accepted by the county, this proposal is guaranteed as written and amended and will be implemented as stated; and (6) mistakes in writing of the submitted proposal will be their responsibility.

NAME _____

DBA/SAME _____

CONTACT _____

ADDRESS _____ CITY/STATE _____ ZIP _____

PHONE _____ FAX _____ HOURS _____

STATE OF INCORPORATION or ORGANIZATION _____ COMPANY WEBSITE _____

ADDRESS _____ EMAIL _____

NUMBER OF LOCATIONS _____ NUMBER OF PERSONS EMPLOYED _____

TYPE OF ORGANIZATION: Public Corporation _____ Private Corporation _____ Sole Proprietorship _____

Partnership _____ Other (Describe): _____

BUSINESS MODEL: Small Business _____ Manufacturer _____ Distributor _____ Retail _____

Dealer _____ Other (Describe): _____

Not a Minority-Owned Business: _____ Minority-Owned Business: _____ (Specify Below)

___ African American (05) ___ Asian Pacific (10) ___ Subcontinent Asian (15) ___ Hispanic (20)

___ Native American (25) ___ Other (30) - Please specify _____

Not a Woman-Owned Business: _____ Woman-Owned Business: _____ (Specify Below)

___ Not Minority -Woman Owned (50) ___ African American-Woman Owned (55)

___ Asian Pacific-Woman Owned (60) ___ Subcontinent Asian-Woman Owned (65) ___ Hispanic Woman Owned (70)

___ Native American-Woman Owned (75) ___ Other – Woman Owned (80) – Please specify _____

ARE YOU REGISTERED TO DO BUSINESS IN THE STATE OF KS: _____ Yes _____ No

INSURANCE REGISTERED IN THE STATE OF KS WITH MINIMUM BEST RATING OF A-VIII: _____ Yes _____ No

ACKNOWLEDGE RECEIPT OF ADDENDA: All addendum(s) are posted to our RFQ/RFP web page and it is the vendor's responsibility to check and confirm all addendum(s) related to this document by going to www.sedgwickcounty.org/finance/purchasing.asp .

NO. _____, DATED _____; NO. _____, DATED _____; NO. _____, DATED _____

In submitting a proposal, vendor acknowledges all requirements, terms, conditions, and sections of this document. Proposal submission format should be by order in which sections are listed throughout the document. All minimum and general requirements should be specifically addressed and detailed in proposer's response. **Exceptions to any part of this document should be clearly delineated and detailed.**

Signature _____ Title _____

Print Name _____ Dated _____

Qty.	Description	Unit Price	Extended Price
1 ea.	Pumper Truck complete as requested	\$	\$
Make/Model:			
Delivery Date:			