CITY
OF
JOPLIN, MISSOURI

BID PACKAGE

#2019-05

for

Heavy Rescue
FIRE APPARATUS

JOPLIN FIRE DEPARTMENT
303 E. 3RD STREET
JOPLIN, MO 64801

Specification	Bidder Complies	
	Yes	No

NOTICE TO BIDDERS

The City of Joplin, Missouri will accept sealed bid proposals until 3:00 P.M., Thursday, March 07, 2019, at the Joplin Fire Department located at 303 E. 3rd Street, Joplin, Missouri, 64801 to PURCHASE the following:

Heavy Rescue Fire Apparatus

Specifications and bid forms are available from James Furgerson, Fire Chief, Joplin Fire Department by calling 417-624-0820 x1300 or by writing to the address indicated above. Any bids received after the specified deadline will be returned to the vendor.

The City reserves the right to evaluate all bids, to reject any or all bids and re-bid at a later date. The City may waive any irregularities in the bid or negotiate variances from specifications, and make awards that are in the best interests of the City. The City will have final decision in all matters regarding acceptance of bids and issuance of awards.

The City encourages minority and female owned businesses to submit bids on all City purchases.

Leslie Haase, CPA
Finance Director

Publication Date: Wednesday, February 06, 2019

Specification	Bidder Complies	
	Yes	No

INSTRUCTIONS TO BIDDERS

The City of Joplin, Missouri proposes to PURCHASE the following:

Heavy Rescue Fire Apparatus

All bids shall have firm-fixed F.O.B. Joplin; Missouri price and shall be honored for a minimum of ninety (90) days following the bid opening.

All bids shall be exclusive of Federal, State, and City taxes.

It is the intent of the specifications included with this bid document to generally describe the item(s) desired in sufficient detail as to secure bids on comparable items. All parts not specifically mentioned which are necessary in order for the item(s) to perform as intended shall be included. The strength, quality of workmanship, and material shall be in accordance with the best trade practices.

Specification variances, manufacturer's literature and additional information should be attached to the bid form. All blanks on the attached bid specifications shall be filled in completely and accurately. Any bid not meeting this requirement may be considered non-responsive.

Any protest or grievance must be issued in writing and delivered to the office of the Director of Finance within ten (10) days following the bid opening. Any protest filed after this time period has elapsed will not be considered.

The City encourages selection of products manufactured, assembled and/or produced in the United States, as long as the quality and price are comparable with other items bid.

Businesses which are located within the city limits of Joplin may be given preference in the awarding of a bid, providing the bid from the local business does not exceed the lowest bid by more than 3% or $2,500, whichever is less.

The City may give preference to vendors handling products that contain post-consumer recovered materials, providing the bid does not exceed the lowest bid by more than 5% or $2,500, whichever is less.

Once the bids are reviewed and evaluated, the successful vendor will be notified, in writing, and will receive an authorized City of Joplin purchase order. Verbal acknowledgments will not be considered as official notification and will not obligate the City in any way. Delivery or performance should not be completed without the receipt of an authorized purchase order.
Minimum information to be submitted with each bid shall consist of the following:

1. Verification of Bid Specifications (with variances noted)
2. Bid Form

Specification	Bidder Complies	
	Yes	No
MARK BID ENVELOPES: "BID #2019-05, 3:00 P.M., Thursday, March 07, 2019, Heavy Rescue Fire Apparatus" Questions concerning the specifications and bidding procedures should be directed to James Furgerson, Fire Chief, Joplin Fire Department at 303 E. 3rd St, Joplin, MO, 64801 or by phoning 417-624-0820 x1300. **Trade in** Please include a trade in value with your bid of the existing rescue truck. To schedule an evaluation of it contact James Furgerson, Joplin Fire Department at 303 E. 3rd St, Joplin, MO, 64801 or by phoning 417-624-0820 x1300.		

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DETAILED SPECIFICATIONS FOR
Heavy Rescue Fire Apparatus

Joplin Fire Department

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SPECIFICATIONS FOR A Heavy Rescue

INTENT OF SPECIFICATIONS

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 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 (O.E.M.) nor 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).

Bids 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, bidder shall maintain dedicated service facilities for the repair and service of products. Evidence of such a facility shall be included in bidder proposal.

Each bidder 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 bidder shall also show that the company is in position to render prompt service and to furnish replacement parts.

Each bid 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.

QUALITY AND WORKMANSHIP

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

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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. **DELIVERY** Apparatus, to ensure 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. **INFORMATION REQUIRED** 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 and drive axle. **PERFORMANCE TESTS AND REQUIREMENTS** A road test shall be conducted on a continuous run of ten (10) miles or more 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. 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).		

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FAILURE TO MEET TEST

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 bidder 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 bidder of such changes, shall also be cause for rejection of the apparatus. Permission to keep or store the apparatus in any building owned or occupied by the purchaser or its use by the purchaser during the above-specified period with the permission of the bidder shall not constitute acceptance.

LIABILITY

The successful bidder 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.

SPECIFICATION BID REQUIREMENTS

Bidders shall also indicate in the "yes/no" column if their bid 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.

Proposals taking total exception to specifications shall not be acceptable.

Also, bidders shall submit a detailed proposal. A letter only, even though written on a company letterhead, shall not be sufficient. Bid proposals shall be submitted in the same sequence as specifications for ease of evaluation, comparison and checking of compliance. **An exception to these requirements shall not be tolerated.**

EXCEPTIONS

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.

GENERAL CONSTRUCTION

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.

COMMERCIAL GENERAL LIABILITY INSURANCE

The successful bidder shall, during the performance of the contract and for three (3) years following acceptance of the product, keep in force at least the following minimum limits of commercial general liability insurance:

Each Occurrence	$1,000,000
Products/Completed Operations Aggregate	$1,000,000
Personal and Advertising Injury	$1,000,000
General Aggregate	$5,000,000

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	Yes	No
Coverage shall be written on a Commercial General Liability form. The policy shall be written on an occurrence form and shall include Contractual Liability coverage for bodily injury and property damage subject to the terms and conditions of the policy. The policy shall include Owner as an additional insured when required by written contract. **COMMERCIAL AUTOMOBILE LIABILITY INSURANCE** The successful bidder shall, during the performance of the contract keep in force at least the following minimum limits of commercial automobile liability insurance: Each Accident Combined Single Limit: $1,000,000 Coverage shall be written on a Commercial Automobile liability form. **UMBRELLA/EXCESS LIABILITY INSURANCE** The successful bidder shall, during the performance of the contract and for three (3) years following acceptance of the product, keep in force at least the following minimum limits of umbrella liability insurance: Aggregate: $25,000,000 Each Occurrence: $25,000,000 The umbrella policy shall be written on an occurrence basis and at a minimum provide excess to the Bidder's General Liability, Automobile Liability and Employer's Liability policies. The required limits can be provided by one (1) or more policies provided all other insurance requirements are met. Coverage shall be provided by a carrier(s) rated A- or better by A.M. Bests. All policies shall provide a 30 day notice of cancellation to the named insured. The Certificate of Insurance shall provide the following cancellation clause: Should any of the above described polices be cancelled before the expiration date thereof, notice shall be delivered in accordance with the policy provisions. Bidder agrees to furnish owner with a current Certificate of Insurance with the coverages listed above along with its bid. The certificate shall show the purchaser as certificate holder. **ISO COMPLIANCE** The manufacturer shall operate a Quality Management System under the requirements of ISO 9001. These standards sponsored by the International Organization for Standardization (ISO) specify the quality systems that shall be established by the manufacturer for design, manufacture, installation and service. A copy of the certificate of compliance shall be included with the bid. **NFPA 2009 STANDARDS** 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, vendor has not received certification from this chassis manufacturer		

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	Yes	No
that all criteria have been met. The body as built by the manufacturer must comply with the NFPA standards effective January of 2009. Certification of slip resistance of all stepping, standing and walking surfaces must be supplied with delivery of the apparatus. A plate that is highly visible to the driver while seated shall be provided. This plate shall show the overall height, length, and gross vehicle weight rating. The manufacturer shall have programs in place for training, proficiency testing and performance for any staff involved with certifications. An official of the company shall designate, in writing, who is qualified to witness and certify test results. **BID BOND** 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. 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. **INSPECTION TRIPS** The bidder shall provide one (1) factory prebuild conference trip for 3 customer representatives. And one (1) factory pre-delivery conference trip for 4 customer representatives. The inspection trips shall be scheduled at times mutually agreed upon between the manufacturer's representative and the customer. All costs such as travel, lodging and meals shall be the responsibility of the bidder. **REFERENCE DRAWING** A drawing of the proposed apparatus shall be provided for review. This drawing shall indicate the major components such as the chassis make and		

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	Yes	No
model, body configuration and door style, location of the lights, siren, horns, compartments, major components, etc. **ELECTRICAL WIRING DIAGRAMS** Two (2) electrical wiring diagrams, prepared for the body as it interfaces with the commercial chassis, shall be provided. **CHASSIS** The chassis shall be a Kenworth Medium duty chassis, supplied with the following equipment: **WHEELBASE** The wheelbase of the vehicle shall be no greater than 205". **GVW RATING** The gross vehicle weight rating shall be a minimum of 45,500. **FRAME** The frame rails shall be formed from 120,000 psi yield, heat treated alloy steel. **CAB** Type: Conventional (engine forward) Construction: Welded Steel and Fiberglass Accessories: - Tinted Glass in all Windows - Black Rubber Floormats - Dual Sun-Visors - 18.00" Cab Entrance Handrails - 1.28" diameter extruded aluminum with rubber inserts, One (1) each side - Dome Light with Map Light - Fresh Air Heater and Defroster - Fiberglass Front End, Three (3) Piece Construction - Hood Mounted Chrome Grille - Composite Aero Design Halogen Headlights - Daytime Running Lights **CAB INTERIOR, IHC, GRAY** Gray Vinyl Upholstery **CAB GRILLE - STATIONARY** The cab grille shall be a chrome plated high impact plastic with a vertical channel design, and shall include chrome headlight bezels. The grille shall be attached to the radiator core support structure and shall not tilt with the hood. **MIRRORS** Lang Mekra 15.75" x 7.09" mirrors, with breakaway type brackets, integral convex, heated, thermostatically controlled, clearance lights, both sides remote controlled and black finish, shall be provided.		

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CAB ACCESS STEPS The cab steps shall be provided by the chassis manufacturer. These steps shall be modified by the apparatus manufacturer as required to meet NFPA step requirements. Bright aluminum tread plate trim between the steps shall be provided by the apparatus manufacturer. A bright aluminum overlay shall be placed over any fuel tank, under the mounting bands. Access to the chassis batteries shall be provided if batteries are located under the cab. **STEP LIGHTS** There shall be four (4) white LED step lights provided. There shall be one (1) light installed at each cab door, one (1) light per doorstep. In order to ensure exceptional illumination, each light shall provide a minimum of 25 foot-candles (fc) covering an entire 15" x 15" square placed ten (10) inches below the light and a minimum of 1.5 fc covering an entire 30" x 30" square at the same ten (10) inch distance below the light. The lights shall be activated when the adjacent door is opened. **DAYTIME RUNNING LIGHTS** The chassis shall be provided with daytime running lights. **AIR CONDITIONING** Shall be an integral heater and defroster shall be provided. The system shall deliver a 12,000 BTU/hour in the air conditioning mode when tested per SAE J1484 with inlet air conditions of 80 degrees Fahrenheit dry bulb and 67 degrees Fahrenheit wet bulb. The system includes Hydro Fluorocarbon HFC-134A refrigerant. **ENGINE COMPARTMENT LIGHTS** Two (2) engine compartment lights shall be installed under the engine hood, of which the switches are an integral part. **CAB CONSOLE** A center cab console shall be provided between the Driver's and Officer's seats. Console shall be as large as possible and fabricated of 1/8" smooth aluminum. A textured powder coat paint finish shall be provided for durability and finished appearance. The rear portion of the console shall be provided with open top storage for notebooks or maps. Two (2) adjustable dividers shall be provided in the storage area. The forward portion of console shall be slanted for easy viewing of the V-Mux display screen, and any siren or radio equipment. The area shall be within easy access to both Driver and Officer. There shall be a flat top section to the front of the console for mounting of a laptop computer with mounting bracket.		

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	Yes	No
The final design of console shall be determined by the Joplin Fire Department at the pre-construction meeting. **SEATING CAPACITY** The seating capacity in the cab shall be two (2). **SEATING** Seating inside the cab shall consist of an air-suspension driver seat and a non-suspension officer seat. **SEAT BELT WEB LENGTH** The chassis seat belt web length as supplied by the commercial chassis manufacturer shall be compliant to NFPA 14.1.3.2 and 14.1.3.3. **SEAT BELTS** All seating positions in the cab and crew cab shall have red seat belts. **SEAT BELT MONITORING SYSTEM** A seat belt monitoring system (SBMS) shall be provided. The SBMS shall be capable of monitoring up to ten (10) seat positions indicating the status of each seat position with a green or red LED indicator as follows: Driver Seat: Seat Occupied Buckled Green No Occupant Unbuckled Not Illuminated The driver seat shall not include an occupant sensor. The display indication for the driver seat shall illuminate red any time the parking brake is released and the driver seat belt is not buckled. All Other Seats: Seat Occupied Buckled Green Seat Occupied Unbuckled Red No Occupant Buckled Red No Occupant Unbuckled Not Illuminated Alarm: The SBMS shall include an audible alarm that shall be activated when a red illumination condition exists and the parking brake is released, or a red illumination condition exists and the transmission is not in park. **CAB INSTRUMENTS** - Engine Temperature Gauge and Warning Buzzer - Engine Oil Pressure Gauge and Warning Buzzer - Speedometer with Odometer - Engine Tachometer - Engine Hourmeter - Fuel Level Gauge - Voltmeter: Low voltage red warning light and audible alarm - Air Brake Pressure Gauge - Air Restriction Indicator - Circuit Breakers: For overload protection of electric circuits - Ignition Switch: Keyless type		

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	Yes	No

FRONT AXLE
Front axle shall be an Arvin Meritor "I" beam type, made of forged steel with a minimum ground rating capacity of 12,000 pounds.

FRONT SUSPENSION
Spring mounted: Parabolic, Taper Leaf
Minimum capacity at ground: 12,000 lb
Shock Absorbers: Double Acting
Shock absorbers shall be provided on the front axle.

TIRES, FRONT
Front tires shall be Goodyear, 11R22.50, radial tires with a tread pattern suitable for the steering axle position. The tire capacity shall meet or exceed the capacity of the axle and/or suspension.

WHEELS, Front
Front tires shall be mounted on Alcoa 22.50" x 9.00" dura-brite polished aluminum disc wheels with a ten (10)-stud, 11.25" bolt circle.

REAR AXLE
The rear axle shall be a Dana Spicer, model S23-170, with a ground rating capacity of 23,000 lb.

REAR AXLE RATIO
A rear axle ratio shall be furnished to allow the vehicle to reach a top speed of 60 MPH.

REAR SUSPENSION
Single Rear Axle Suspension - Kenworth, Reyco or Hendrickson with capacity of 26,000 lbs.

DUST SHIELDS
The front and rear brakes shall be provided with dust shields.

TIRES, REAR
Rear tires shall be Goodyear 11R22.50 radial tires with a traction tread pattern suitable for the drive axle position. The tires shall meet or exceed the weight rating of the axle and/or suspension.

WHEELS, Rear
Rear tires shall be mounted on Alcoa 22.50" x 9.00" dura-brite polished aluminum disc wheels with a ten (10)-stud 11.25" bolt circle..

AUTOMATIC TIRE CHAINS

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	Yes	No
One (1) pair of On spot automatic tire chains shall be provided at the rear. System shall be electric over air operated with switch on cab instrument panel. System to be operable at speeds up to 35 mph. **COVERS, LUG NUT, CHROME** Chrome lug nut covers shall be supplied on front and rear wheels. **MUD FLAPS** Mud flaps shall be installed behind the rear wheels of the apparatus. **ANTI-LOCK BRAKE SYSTEM** The vehicle shall be equipped with a Wabco 4S4M, anti-lock braking system. The ABS shall provide a four (4) channel anti-lock braking control on both the front and rear wheels. A digitally controlled system that utilizes microprocessor technology shall control the anti-lock braking system. Each wheel shall be monitored by the system. When any particular wheel begins to lockup, a signal shall be sent to the control unit. This control unit then shall reduce the braking of that wheel for a fraction of a second and then reapply the brake. This anti-lock brake system shall eliminate the lockup of any wheel thus helping to prevent the apparatus from skidding out of control. The ABS system shall automatically disengage all auxiliary braking devices when required. **ANTI-LOCK BRAKE SYSTEM WARRANTY** The Wabco ABS system shall come with a **three (3) year or 300,000 mile parts and labor** warranty provided by Meritor Wabco Vehicle Control Systems. **BRAKES** The service brake system shall be full air type. The front brakes shall be Knorr/Bendix disc type with a 17.00" ventilated rotor for improved stopping distance. The brake system shall be certified, third party inspected, for improved stopping distance. The rear brakes shall be Meritor™ 16.50" x 8.63" cam operated with automatic slack **AIR COMPRESSOR, BRAKE SYSTEM** The air compressor shall be a Bendix TU-FLO 550 with 13.20 cubic feet per minute output. **AIR DRYER** A Bendix AD-IP air dryer with a heater shall be provided. **AIR INLET WITH AUTOMATIC EJECT** One (1) air inlet with Kussmaul Air Eject shall be provided. It shall allow station air to be supplied to the apparatus brake system through a shoreline hose. The inlet shall automatically disconnect the air line when the truck is started. It shall be equipped with a male coupling and be located mounted ahead of crew cab door at driver's side of cab. A check valve shall be provided		

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to prevent reverse flow of air. The inlet shall discharge into the "wet" tank of the brake system. A mating female coupling shall also be provided with the loose equipment. **COVER OVER AIR INLET** A Kussmaul, Model 091-28-AK, weatherproof red cover shall be provided over the recessed automatic airline disconnect. One (1) twenty-five (25)-ft. length(s) of air hose shall be furnished with fittings. An air chuck shall be provided with the air hose. The air chuck shall fit the valve stems that are provided on the tires. **ENGINE** PACCAR PX-9 Engine, 8.9 Liter, 260-380 HP, 720-1,250 lb-ft of Torque **ENGINE ACCESSORIES** - Fan Clutch: Electric with nylon fan - Air Cleaner: Dry type, with restriction indicator in cab - Fuel Filters included with fuel/water separator - Governor: Limiting speed type - Lube Oil Cooler - Lube Oil Filter: Full flow - Starting Motor: 12-volt - Oil Fill and Level Gauge **ENGINE WARRANTY** The engine shall come with a **five (5) year** warranty provided by the engine manufacturer. **RADIATOR** - Pressurized System, Tube, and Fin - De-aeration Tank and Sight Glass - Anti-Freeze Protection to -40 Degrees Fahrenheit. **HIGH IDLE** A high idle switch shall be provided on the instrument panel inside the cab. Activating the switch shall cause the vehicle to automatically maintain a preset engine rpm. The high idle switch shall be operational only when the parking brake is on and the truck transmission is in neutral. A green indicator light shall be provided adjacent to the switch. The light shall be labeled "OK To Engage High Idle." **FUEL/WATER SEPARATOR** A fuel/water separator with electric heater and filter change/restriction indicator light shall be provided on the chassis.		

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AIR INTAKE, w/EMBER SEPARATOR The air inlet shall be equipped with a stainless steel mesh to separate water and burning embers from the air intake system such that particulate matter larger than 0.039" (1.0 mm) in diameter cannot reach the air filter element. This shall comply with NFPA 1901 and 1906 standards. **EXHAUST SYSTEM** The exhaust system shall include a diesel particulate filter and a diesel oxidation catalyst to meet current EPA standards. The exhaust shall terminate with a horizontal tailpipe and diffuser ahead of the passenger side rear wheels. A heat deflector shield shall be provided where the tail pipe is routed under any side compartmentation. **COOLANT LINES** Premium rubber hose shall be used for all engine coolant lines installed by the chassis manufacturer. Hose clamps shall be of a design commonly called constant torque type to prevent coolant leakage. They shall react to temperature changes in the cooling system and expand or contract accordingly while maintaining a constant clamping pressure on the hose. **FUEL TANK** A 50 gallon fuel tank shall be provided and mounted at the right-hand cab step. The tank shall be constructed of welded aluminum. **TRANSMISSION** An Allison Gen IV, model EVS 3000PR, electronic torque converting automatic transmission with retarder shall be provided. The transmission shall be equipped with prognostics to monitor oil life, filter life, and transmission health. A wrench icon on the shift selector's digital display shall indicate when service is due. Two (2) PTO openings shall be located on left side and top of converter housing (positions 9 o'clock and 3 o'clock). A transmission temperature gauge with red light and audible alarm shall be installed on the cab instrument panel. The transmission retarder control shall be activated 33 percent by release of the accelerator pedal or 66 percent by slight application of the brake pedal, or 100 percent by heavy application of brake pedal. A second on/off switch is provided to activate and deactivate the auto apply portion. The transmission shall have the 1300 ft. lb. torque (medium) spring setting for retardation force. The transmission retarder shall have a master "on/off" switch on the instrument panel. Also, a red indicator light shall be provided to warn that transmission is being overworked. The transmission retarder shall be programmed to act in conjunction with the		

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exhaust brake whenever both are in the on position. The retarder shall be wired to the brake lights so they are energized when the retarder is slowing the vehicle down. **TRANSMISSION SHIFT CONTROL** A push button shift module shall be mounted to right of driver. Shift position indicator shall be indirectly lit for after dark operation. The transmission shall be a five (5)-speed. The transmission ratios shall be 1st - 4.70 to 1.00, 2nd - 2.21 to 1.00, 3rd - 1.53 to 1.00, 4th - 1.00 to 1.00, 5th - 0.76 to 1.00, R - 5.55 to 1.00. **TRANSMISSION COOLER** A transmission oil cooler shall be provided in the lower tank of the radiator. **DRIVELINE** Drivelines shall be a heavy duty metal tube equipped with universal joints properly sized for the application. A splined slip joint shall be provided in each driveshaft. **STEERING** Steering shall consist of an hydraulically driven power steering system with a capacity designed for the axle rating. For additional comfort, the steering wheel column shall have a tilt feature. **BUMPER** A one (1) piece, 10.00" high, stainless steel bumper shall be attached to the front of the frame. A 9.00" channel shall be mounted directly behind the bumper for additional strength. The bumper shall be extended 26.00" from the front face of the cab. A receiver hitch will be installed in the middle under the front bumper for use with a portable winch and rope anchor, electrical connection shall be provided for the winch **TOW HOOKS** Two (2) chromed steel tow hooks shall be installed under the bumper and attached to the front frame members. The tow hooks shall be designed and positioned to allow up to a 6,000 pound straight horizontal pull in line with the centerline of the vehicle. The tow hooks shall not be used for lifting of the apparatus. **GRAVEL PAN** A gravel pan, constructed of bright aluminum tread plate, shall be furnished between the bumper and cab face. The gravel pan shall be properly supported		

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	Yes	No
HYDRAULIC CONECTION INSTALLED IN THE BUMPER EXTENSION Two hydraulic hoses shall be installed from the rear compartment hydraulic power unit and the two-front bumper hydraulic tool connections A total quantity of two (2) connections shall be provided with shut off valves. The hose shall be one (1) continuous length, without unions, and equipped with quick connection type fittings for a 10,000 PSI power unit in the rear compartment The tools being used with this hose are TBD. **EMERGENCY SWITCH PANEL** An emergency switch panel shall be provided in the cab overhead of the drivers seating position. **"DO NOT MOVE APPARATUS" INDICATOR** A flashing red indicator light (located in the driving compartment) shall be illuminated automatically per the current edition of NFPA. The light shall be labeled "Do Not Move Apparatus If Light Is On". **OPEN DOOR INDICATOR LIGHT** A red "open door" indicator light shall be provided inside the cab, in clear view of the driver, to warn of an open compartment door. **WIPER CONTROL** Wiper control shall include an intermittent feature and windshield washer controls. **VEHICLE DATA RECORDER** A vehicle data recorder (VDR) shall be provided. The VDR shall be capable of reading and storing vehicle information. The VDR shall be capable of operating in a voltage range from 8VDC to 16VDC. The VDR shall not interfere with, suspend, or delay any communications that may exist on the CAN data link during the power up, initialization, runtime, or power down sequence. The VDR shall continue operation upon termination of power or at voltages below 8VDC for a minimum of 10ms. The information stored on the VDR can be downloaded through a USB port mounted in a convenient location determined by cab model. A CD provided with the apparatus shall include the programming to download the information from the VDR. A USB cable can be used to connect the VDR to a laptop to retrieve required information. The vehicle data recorder shall be capable of recording the following data via hardwired and/or CAN inputs: Vehicle Speed - MPH Acceleration - MPH/sec		

Specification	Bidder Complies	
	Yes	No
Deceleration - MPH/sec Engine Speed - RPM Engine Throttle Position - % of Full Throttle ABS Event - On/Off Seat Occupied Status - Yes/No by Position (1-6 Seating Capacity) Seat Belt Buckled Status - Yes/No by Position (1-6 Seating Capacity) Master Optical Warning Device Switch - On/Off Time - 24 Hour Time Date - Year/Month/Day **EMERGENCY LIGHTING AND EQUIPEMENT** **CAB ROOF LIGHTBAR** One (1) Whelen, Model: Freedom LED lightbar which spans the full width of the cab shall be mounted on the cab roof. This lightbar shall include the following: Two (2) red flashing forward facing LED modules. Two (2) clear flashing forward facing LED modules. Two (2) red flashing front corner LED modules. One (1) Blue flashing driver side facing LED module. One (1) Blue flashing officer side facing LED module. One (1) switch located in the cab on the switch panel shall control this lightbar. The *3-M model 592-14 Hz pre-emption* Opticom emitter shall be mounted in the center section of the light bar and switched to activate and de activate with the parking brake. All lens colors shall be clear. To meet NFPA requirements, all white lights shall be deactivated when the parking brake is applied. . **WARNING LIGHTS** Two (2) Whelen model 60*02F*R Super LED lights shall be installed on the Grill, above the headlights kit. The LEDs shall be required for NFPA and shall meet or exceed the NFPA required light output for the front lower zone. The color of these LEDs shall be split red/blue Super LED/clear lens both sides. Both lights shall be activated by the same switch in the cab. **SIDE ZONE LOWER LIGHTING** Two (2) Whelen model 60*02F*R Super LED lights shall be installed at the following positions: Two (2) lights, one (1) each side on the extended front bumper. The color of these LEDs shall be split red/blue Super LED/clear lens both sides Two (2) lights, over each rear wheel.		

Specification	Bidder Complies	
	Yes	No
The color of these LEDs shall be split red/blue Super LED/clear lens both sides. The above four (4) lights shall be required to meet the lower level optical warning and optical power requirements of NFPA. One (1) switch located in the cab on the switch panel shall control these lights. These lights shall be provided with a chrome plated ABS plastic flange **REAR ZONE LOWER LIGHTING** Two (2) Whelen model 60*02F*R flashing "Super" LED warning lights shall be located at the rear of the apparatus, required to meet or exceed the lower level optical warning and optical power requirements of NFPA. The color of these LEDs shall be split red/blue Super LED/clear lens both sides. One (1) switch in the cab on the switch panel shall control these lights. These lights shall be installed with a flange. **WARNING LIGHTS (Rear and Side upper zones)** Six (6) Whelen Super-LED® lights shall be provided to meet the NFPA upper zone B, C and D lighting requirements: The following lights shall be provided on the sides of the truck: Four (4) model 60*02F*R warning lights, two (2) facing the driver side and two (2) facing the passenger side. The color of these LEDs shall be split red/blue Super LED/clear lens both sides. The following lights shall be provided at the rear of the truck: Two (2) model 90*R5F*R warning lights facing the rear. The color of these LEDs shall be split red/blue Super LED/clear lens both sides. These lights shall be installed with a flange. Per NFPA, the lights shall be switched on or off by a lighted switch on the instrument panel. **TRAFFIC DIRECTING LIGHT** There shall be one (1) Whelen model TAL85 46.81" long x 2.84" high x 2.24" deep, amber LED traffic directing light installed at the rear of the apparatus. The Whelen model TACTLD1 control head shall be included with this installation. The auxiliary warning mode shall be activated with the emergency master switch.This traffic directing light shall be surface mounted over the rear door, at the rear of the apparatus as high as practical.		

Specification	Bidder Complies	
	Yes	No
The traffic directing light controller shall be located within the switch panel on the center console. The controller shall be within easy reach of the driver. **FEDERAL Q2B SIREN** Chrome plated and exterior mounted Federal 10" Q2B coaster siren shall be installed on top of the front bumper extension on the drivers' side. The siren shall be operated from a floor mounted foot switch on the Drivers and Officers side. An electric siren brake switch shall be located on the switch panel on the driver's side. **AIR HORN SYSTEM** Two (2) Grover round air horns with 6.00" bell shall be provided and located one (1) each side of the engine. The horn system shall be piped to the air brake system wet tank utilizing 0.38" tubing. A pressure protection valve shall be installed in-line to prevent the loss of air, in the air brake system. **AIR HORN CONTROL** The air horns shall be actuated by two (2) foot switches, one (1) located on the officer's side and one (1) on the driver's side. **ELECTRONIC SIREN** A Southern VP Remote mount model 441 magnum or equivalent, electronic siren with noise canceling microphone shall be provided. Siren Control shall be located in the center console easily accessible by either the driver or officer. The siren amplifier shall be mounted in the radio equipment box under the officer's seat. The driver shall have the option to control the siren or the chassis horns from the horn button by means of a selector switch. **SPEAKER** There shall be two (2) speakers, Code-3 Model PB100C with chrome finish provided. Connection shall be connected to the siren amplifier. The speaker(s) shall be recessed in the front bumper on the driver's side. **INTERCOM SYSTEM** A two (2) position David Clark, Model U3800, intercom system with radio interface at two (2) positions shall be provided. - Driver position shall have radio interface capability - Officer position shall have radio interface capability The following components shall be supplied with this system: - One (1)-U3815 Radio Interface Module (Driver) - One (1)-U3811 Radio Interface Modules (Officer) - One (1)-H3341 Single Ear Headset (Driver) - One (1)-H3342 Headset (Officer) - One (1)-C3820 Power Cable. All necessary cables and connectors shall be provided.		

Specification	Bidder Complies	
	Yes	No
RADIO INTERFACE CABLE The body builder shall supply and install the required radio interface cable before delivery of the vehicle. The radio equipment to be used by the customer shall be Motorola XTL 5000 **HEADSET HANGERS** There shall be two (2) headset hanger/s installed for the intercom system. The hanger/s shall be installed as determined in the pre-build conference. **RADIO ANTENNA MOUNT** Two (2) antenna mounting bases, 1 shall be a Motorola model NMO mounts with sufficient amount of coax cable and weatherproof cap shall be provided for a two way radio. The second antenna shall be a GPS antenna, 3-5 volt, 2 5/8" in diameter and terminate in a SMB connector. Both mounts shall be located on the cab roof just to the rear of the officers and drivers seats. The cable shall be routed to a point to be determined during the pre-build conference with at least five (5) additional feet of coax incase a unit needs moved. **CUSTOMER RADIO WIRING** There shall be three (3) 12 volt combination wiring leads of which each shall include, one (1) battery switched, one (1) ignition and one (1) negative, for use with radio equipment. Each lead shall be 18" long and be provided [Location]. The leads shall be clearly marked and in a coil. A breaker rated for 30 amps shall be provided for circuit protection of the battery switched lead with a minimum of 10 gauge wire. The ignition lead is for sensing purposes only. The wires shall be colored coded as follows: -red for battery switched -yellow for ignition -black for ground Wires shall be ran to locations determined during the Pre-construction conference. **DEDICATED RADIO EQUIPMENT CONNECTION POINTS** There shall be three (3) studs provided in the primary power distribution center located in front of the officer for two-way radio equipment. The studs shall consist of the following: 12-volt 40-amp battery switched power 12-volt 60-amp ignition switched power 12-volt 60-amp direct battery power There shall also be a 12-volt 100-amp ground stud located in or adjacent to the power distribution center. **VEHICLE CAMERA SYSTEM** A camera system with a CW144639CAI rear view camera shall be provided. The rear view camera features a built in microphone, activated with the camera.		

Specification	Bidder Complies	
	Yes	No
Camera shall be located at the rear of the vehicle, as close to center as possible, activated when the vehicle is put into reverse. The camera images shall be displayed on the driver's 7"color LCD screen that shall be capable of displaying up to four (4) camera images simultaneously. The display shall be located on the lower console by the driver's seating position. Audio from the microphone on the active camera shall be emitted by a speaker in the 7" LCD display. **VEHICLE ELECTRICAL** **12 Volt system** All 12-volt electrical equipment installed by the apparatus manufacturer shall conform to modern automotive practices. All wiring shall be high temperature crosslink type. Wiring shall be run in loom or conduit where exposed and have grommets where wire passes through sheet metal. Automatic reset circuit breakers shall be provided which conform to SAE Standards. Wiring shall be color, function and number coded. Function and number codes shall be continuously imprinted on all wiring harness conductors at 2.00" intervals. Exterior exposed wire connectors shall be positive locking, and environmentally sealed to withstand elements such as temperature extremes, moisture and automotive fluids. Electrical wiring and equipment shall be installed utilizing the following guidelines: (1) All holes made in the roof shall be caulked with silicon. Rope caulk is not acceptable. Large fender washers, liberally caulked, shall be used when fastening equipment to the underside of the cab roof. (2) Any electrical component that is installed in an exposed area shall be mounted in a manner that shall not allow moisture to accumulate in it. Exposed area shall be defined as any location outside of the cab or body. (3) Electrical components designed to be removed for maintenance shall not be fastened with nuts and bolts. Metal screws shall be used in mounting these devices. Also a coil of wire shall be provided behind the appliance to allow them to be pulled away from mounting area for inspection and service work. (4) Corrosion preventative compound shall be applied to all terminal plugs located outside of the cab or body. All non-waterproof connections shall require this compound in the plug to prevent corrosion and for easy separation (of the plug). (5) All lights that have their sockets in a weather exposed area shall have corrosion preventative compound added to the socket terminal area. (6) All electrical terminals in exposed areas shall have silicon (1890) applied completely over the metal portion of the terminal. All emergency light switches shall be mounted on a separate panel installed in the cab. A master warning light switch and individual switches to be provided to allow pre-selection of emergency lights. The light switches shall be "rocker" type with an internal indicator light to show when switch is energized. All switches shall be properly identified and mounted in a removable panel for ease in		

Specification	Bidder Complies	
	Yes	No
servicing. Identification of the switches shall be done by either printing or etching on the switch panel. The switches and identification shall be illuminated. All lights and reflectors, required to comply with Federal Motor Vehicle Safety Standard #108, shall be furnished. Rear identification lights shall be recessed mounted for protection. Lights and wiring mounted in the rear bulkheads shall be protected from damage by installing a false bulkhead inside the rear compartments. An operational test shall be conducted to ensure that any equipment that is permanently attached to the electrical system is properly connected and in working order. The results of the tests shall be recorded and provided to the purchaser at time of delivery. **12 VOLT MULTIPLEX CONTROL CENTER** The apparatus shall be equipped with a Weldon V-MUX multiplexed 12 volt electrical system that will provide complete diagnostic capability, No Exception. The system shall have the capability of delivering multiple signals via a CAN bus, utilizing specifications set forth by SAE J1939. The system shall be node based to maximize stability so that failure of one node does not affect the operation of the other nodes. The system shall use shielded twisted-pair wire for transmission of system function signals. The shielded wire shall provide protection against EMI and RFI noise interruptions. The multiplex system shall be responsible for providing power management functions as well as load shedding. The warning light system shall be controlled by the multiplex system. The system shall be capable of displaying text and/or graphic messages on a display module. The system shall be based on solid-state technology and shall include self-contained diagnostic indicators. **Outputs:** The outputs shall perform all the following items without added modules to perform any of the tasks; 1. **Load Shedding**: The system shall have the capability to load shed with 8 levels any output. This means you can specify which outputs (barring NFPA restrictions) you would like load shed. Level 1 12.9v, Level 2 12.5V, Level 3 - 12.1V, Level 4 - 11.7V, Level 5 11.3V, Level 6 10.9V, Level 7 10.5, Level 8 10.1. Unlike conventional load shedding devices you can assign a level to any or all outputs. 2. **Load Sequencing:** The system shall be able to sequence from 0 8 levels any output. With 0 being no delay and 1 being a 1 second delay, 2 being a 2 second delay and so on. Sequencing reduces the amount of voltage spikes and drops on your vehicle, and can help limit damage to your charging system.		

Specification	Bidder Complies	
	Yes	No
3. **Output Device:** The system shall have solid-state output devices. Each solid-state output shall be a MOS-FET (Metal Oxide Semiconductor - Field Effect Transistors); MOS-FETs are solid-state devices with no moving parts to wear out. A typical relay when loaded to spec has a life of 100,000 cycles. The life of a FET is more than *100 times* that of a relay. 4. **Flashing Outputs:** The system shall be able to flash any output in either A or B phase, and logic is used to shut down needed outputs in park, or any one of several combined interlocks. The flash rate can be selected at either 80, 160 or 200 FPM. This means any light can be specified with a multiplex truck with no need to add flashers. Flashing outputs can also be used to warn of problems or other unique idea you may come up with. 5. **PWM:** The modules shall have the ability to PWM at some outputs so that a headlight PWM module is not needed. 6. **Diagnostics:** An output should be able to detect either a short or open circuit. The system should be able report in "real time" a text based message that points the maintenance person to a specific output. **Inputs:** 1. The inputs shall have the ability to switch by a ground or vbatt signal. 2. The inputs shall be filtered for noise suppression via hardware and software so that RF or dirty power will not trick an input into changing its status. **Auto-Throttle:** The multiplex system shall be able to perform automatic high idle via a network gateway or by using an existing output on a module to provide the proper signals to an OEM Engine ECU. This task should be handled with existing inputs and outputs. **Displays:** Displays shall be able to provide real time information regarding load shedding and system status, such as network traffic/errors or shorts and open circuits. **System Network:** The multiplex system shall contain a Peer-to-Peer network. A Master Slave Type network is not suitable for this type of unit. A Peer-to-Peer network means that all the modules are equal on the network; a Master is not needed to tell other nodes when to talk, **No Exceptions.**		

Specification	Bidder Complies	
	Yes	No
System Reliability: The multiplex system shall be able to perform in extreme temperature conditions, from 40° to +85° C (-40° to +185° F.) The system shall be sealed against the environment, moisture, humidity, salt or fluids such as diesel fuel, motor oil or brake fluid. The enclosures shall be rugged to withstand being mounted in various locations or compartments around the vehicle. The modules shall be protected from over voltage and reverse polarity. **WELDON CERTIFICATION** A letter shall be provided with bid submittal that the Contractor has successfully completed the Weldon training requirements for Level 1 of the V-MUX Certified Supplier Program and is authorized to design, build, and service V-MUX electrical systems. **MULTIPLEX SYSTEM VISTA IV V-MUX COLOR DISPLAY** One (1) Weldon V-MUX Vista IV shall be provided. The Vista IV shall have seven switches with custom legends and a wide temperature operating range. The four wires shall control all lighting and HVAC. The Vista IV shall have color changes for button status. The display shall be pre-programmable (OEM Level) and be colored. The auto climate control shall display temperature set point and outside temperatures. The Vista IV shall be ready for back-up camera, thermal cameras and DVDs. Virtual switches, GPS, on-board diagnostics, 6" and 9" Pana Vise options and large font size shall also be included. The Vista IV allows for peer to peer networking. The Vista IV shall have the ability to automatically change screens based on a predetermined state or condition for warning message or status. The V-Mux display shall be located in the cab center console for control of all master and emergency lights. **BATTERY SYSTEM** A single starting battery system shall be provided consisting of three (3) 12 volt, 650 CCA, maintenance-free, group 31 batteries. The batteries system shall have a total of 1950 CCA with a minimum reserve capacity of 540 minutes. **MASTER BATTERY SWITCH** A master battery switch, to activate the battery system, shall be provided inside the cab within easy reach of the driver. The master battery disconnect switch shall be wired between the starter solenoid and the remainder of the electrical loads on the apparatus.		

Specification	Bidder Complies	
	Yes	No
A green "battery on" indicator light, visible from the driver's position, shall be provided. **KUSSMAUL AUTO EJECT FOR SHORELINE** One (1) shoreline receptacle shall be provided to operate the dedicated 120-volt circuits on the truck without the use of the generator. The shoreline receptacle (s) shall be provided with a NEMA 5-20, 120 volt, 20 amp, straight blade Kussmaul Super auto eject plug with a red weatherproof cover. The cover is spring loaded to close, preventing water from entering when the shoreline is not connected. The unit is completely sealed to prevent road dirt contamination. A solenoid wired to the vehicle's starter is energized when the engine is started. This instantaneously drives the plug from the receptacle. An internal switch arrangement shall be provided to disconnect the load prior to ejection to eliminate arcing of the connector contacts. The shoreline shall be connected to Battery direct. A mating connector body shall also be supplied with the loose equipment. The shoreline receptacle shall be located on the driver side front bulkhead of body. **BATTERY CHARGER/ AIR COMPRESSOR** A Kussmaul Pump Plus 1200, model 091-9-1200 single output battery charger/air compressor system shall be provided. A display bar graph indicating the state of charge shall be included. The automatic charger shall maintain one (1) set of batteries with a maximum output current of 40 amps. The 12-volt air compressor shall be installed to maintain the air system pressure when the vehicle is not in use. The battery charger shall be wired to the AC shoreline inlet through an AC receptacle adjacent to this battery charger. Battery charger shall be located in the cab behind the driver seat. The battery charger indicator shall be located on the driver's seat riser. **ALTERNATOR** The alternator shall be a 12V, 300 Amp, Lecce Neville pad mount alternator. **EXTERIOR LIGHTING** Exterior lighting shall meet or exceed Federal Department of Transportation, Federal Motor Vehicle Safety Standards and National Fire Protection Association requirements in effect at time of proposal. Front headlights shall be halogen type and comply to all FMVSS requirements. Five (5) clearance and marker lights shall be installed across the leading edge of the cab.		

Specification	Bidder Complies	
	Yes	No

REAR ID/MARKER DOT LIGHTING

There shall be one (1) Truck-Lite Model 15050R three (3) LED light kit used as identification lights located at the rear of the apparatus per the following:
- As close as practical to the vertical Centerline.
- Centers spaced not less than six (6) inches or more than twelve (12) inches apart.
- Red in color.
- All at the same height.

There shall be two (2) LED lights installed at the rear of the apparatus used as clearance lights located at the rear of the apparatus per the following:
- To indicate the overall width of the vehicle.
- One (1) each side of the vertical centerline.
- As near the top as practical.
- Red in color.
- To be visible from the rear.

There shall be two (2) LED lights installed on the side of the apparatus as close to the rear as practical per the following:
- To indicate the overall length of the vehicle.
- One (1) each side of the vertical centerline.
- As near the top as practical.
- Red in color.
- To be visible from the side.

Per FMVSS 108 and CMVSS 108 requirements.

REAR FMVSS LIGHTING

A pair of Weldon LED, three (3) lamp modules shall be provided. Each module shall include a stop-tail light, arrow directional light and backup light mounted in polished aluminum housing.

The lights shall be mounted on the face of the rear body compartments.
Four (4) red reflectors shall be provided.

A Cast Product License plate bracket Model LP0004-1-B with LED light shall be mounted on the driver's side above the warning lights.

BACK-UP ALARM

A solid-state electronic audible back-up alarm that actuates when the truck is shifted into reverse shall be provided. The device shall sound at 60 pulses per minute and automatically adjust its volume to maintain a minimum ten (10) dBA above surrounding environmental noise levels.

PERIMETER SCENE LIGHTS, CAB

There shall be a 4.00", LED, grommet mounts weatherproof light provided for each cab door. Lighting shall be designed to provide illumination on areas under the driver, officer, and crew cab riding area exits, which shall be activated automatically when the exit doors are opened, by the door jam switch and by the same means as the body perimeter lights.

Specification	Bidder Complies	
	Yes	No
The lighting shall be capable of providing illumination at a minimum level of two (2) foot-candles on ground areas within 30.00" of the edge of the apparatus in areas which personnel climb in or out of the apparatus or descend from the apparatus to the ground level. **PERIMETER SCENE LIGHTS, BODY** There shall be a total of four (4), LED lights provided on the apparatus. Each light shall consist of a 4.00" weatherproof LED light, rubber mount, and pigtail kit. The lighting shall be capable of providing illumination at a minimum level of two (2) foot-candles on ground areas within 30.00" of the edge of the apparatus in areas designed for personnel to climb onto the apparatus or descend from the apparatus to the ground level. The lights shall be activated by a cab and crew cab door switch and a switch on the instrument panel. **STEP LIGHTS** There shall be two (2) white LED step lights shall be provided at the rear to illuminate the tailboard/step area. In order to ensure exceptional illumination, each light shall provide a minimum of 25 foot-candles (fc) covering an entire 15" x 15" square placed ten (10) inches below the light and a minimum of 1.5 fc covering an entire 30" x 30" square at the same ten (10) inch distance below the light. These step lights shall be actuated with the perimeter scene lights. All other steps on the apparatus shall be illuminated per the current edition of NFPA 1901. **SCENE LIGHTS** There shall be six (6) Whelen, Model 60C0ELZR Gradient LED scene light(s) with chrome flange installed Two (2) at the rear of the apparatus Two (2) on both the right and left side of the body. A switch shall be mounted on the drivers lighting control panel for each set of light. left, right, and rear These lights may be load managed when the parking brake is set. **ELECTRICAL SYSTEM GENERAL DESIGN** **220/120 VOLT ALTERNATING CURRENT SYSTEM** The following guidelines shall apply to the 120/240 VAC system installation: General		

Specification	Bidder Complies	
	Yes	No
Any fixed line voltage power source producing alternating current (ac) line voltage shall produce electric power at 60 cycles plus or minus 5 cycles. Except where superseded by the requirements of NFPA 1901, all components, equipment and installation procedures shall conform to NFPA 70, National Electrical Code (herein referred to as the NEC). Line voltage electrical system equipment and materials included on the apparatus shall be listed and installed in accordance with the manufacturer's instructions. All products shall be used only in the manner for which they have been listed. <u>Grounding</u> Grounding shall be in accordance with Section 250-6 "Portable and Vehicle Mounted Generators" of the NEC. Ungrounded systems shall not be used. Only stranded or braided copper conductors shall be used for grounding and bonding. An equipment grounding means shall be provided in accordance with Section 250-91 (Grounding Conductor Material) of the NEC. The grounded current carrying conductor (neutral) shall be insulated from the equipment grounding conductors and from the equipment enclosures and other grounded parts. The neutral conductor shall be colored white or gray in accordance with Section 200-6 (Means of Identifying Grounding Conductors) of the NEC. In addition to the bonding required for the low voltage return current, each body and driving or crew compartment enclosure shall be bonded to the vehicle frame by a copper conductor. This conductor shall have a minimum amperage rating of 115 percent of the nameplate current rating of the power source specification label as defined in Section 310-15 (amp capacities) of the NEC. A single conductor properly sized to meet the low voltage and line voltage requirements shall be permitted to be used. All power source system mechanical and electrical components shall be sized to support the continuous duty nameplate rating of the power source. <u>Operation</u> Instructions that provide the operator with the essential power source operating instructions, including the power-up and power-down sequence, shall be permanently attached to the apparatus at any point where such operations can take place. Provisions shall be made for quickly and easily placing the power source into operation. The control shall be marked to indicate when it is correctly positioned for power source operation. Any control device used in the drive train shall be equipped with a means to prevent the unintentional movement of the control device from its set position.		

Specification	Bidder Complies	
	Yes	No
A power source specification label shall be permanently attached to the apparatus near the operator's control station. The label shall provide the operator with the information detailed in Figure 19-4.10. Direct drive (PTO) and portable generator installations shall comply with Article 445 (Generators) of the NEC. <u>Overcurrent protection</u> The conductors used in the power supply assembly between the output terminals of the power source and the main over current protection device shall not exceed 144 inches. (3658 mm) in length. For fixed power supplies, all conductors in the power supply assembly shall be type THHW, THW, or use stranded conductors enclosed in nonmetallic liquid tight flexible conduit rated for a minimum of 194 degree Fahrenheit (90 degrees Celsius). For portable power supplies, conductors located between the power source and the line side of the main overcurrent protection device shall be type SO or type SEO with suffix WA flexible cord rated for 600-volts at 194 degrees Fahrenheit (90 degrees Celsius). <u>Wiring Methods</u> Fixed wiring systems shall be limited to the following: - Metallic or nonmetallic liquid tight flexible conduit rated at not less than 194 degrees Fahrenheit (90 degrees Celsius) or - Type SO or Type SEO cord with a WA suffix, rated at 600 volts at not less than 194 degrees Fahrenheit (90 degrees Celsius) Electrical cord or conduit shall not be attached to chassis suspension components, water or fuel lines, air or air brake lines, fire pump piping, hydraulic lines, exhaust system components, or low voltage wiring. In addition the wiring shall be run as follows. - Separated by a minimum of 12 inches (305 mm), or properly shielded, from exhaust piping - Separated from fuel lines by a minimum of six (6) inches (152 mm) distance. Electrical cord or conduit shall be supported within six (6) inches (152 mm) of any junction box and at a minimum of every 24 inches (610 mm) of continuous run. Supports shall be made of nonmetallic materials or corrosion protected metal. All supports shall be of a design that does not cut or abrade the conduit or cable and shall be mechanically fastened to the vehicle. <u>Wiring Identification</u>		

Specification	Bidder Complies	
	Yes	No
All line voltage conductors located in the main panel board shall be individually and permanently identified. The identification shall reference the wiring schematic or indicate the final termination point. When prewiring for future power sources or devices, the unterminated ends shall be labeled showing function and wire size. Wet Locations All wet location receptacle outlets and inlet devices, including those on hardwired remote power distribution boxes, shall be of the grounding type provided with a wet location cover and installed in accordance with Section 210-7 "Receptacles and Cord Connections" of the NEC. All receptacles located in a wet location shall be not less than 24 inches (610 mm) from the ground. Receptacles on off-road vehicles shall be a minimum of 30 inches (762 mm) from the ground. The face of any wet location receptacle shall be installed in a plane from vertical to not more than 45 degrees off vertical. No receptacle shall be installed in a face up position. Dry Locations All receptacles located in a dry location shall be of the grounding type. Receptacles shall be not less than 30 inches (762 mm) above the interior floor height. All receptacles shall be marked with the type of line voltage (120-volts or 240-volts) and the current rating in amps. If the receptacles are direct current, or other than single phase, they shall be so marked. Listing All receptacles and electrical inlet devices shall be listed to UL 498, Standard for Safety Attachment Plugs and Receptacles, or other appropriate performance standards. Receptacles used for direct current voltages shall be rated for the appropriate service. Electrical System Testing The wiring and associated equipment shall be tested by the apparatus manufacturer or the installer of the line voltage system. The wiring and permanently connected devices and equipment shall be subjected to a dielectric voltage withstand test of 900-volts for one (1) minute. The test shall be conducted between live parts and the neutral conductor, and between live parts and the vehicle frame with any switches in the circuit(s) closed. This test shall be conducted after all body work has been completed. Electrical polarity verification shall be made of all permanently wired equipment and receptacles to determine that connections have been properly made.		

Specification	Bidder Complies	
	Yes	No
Operational Test per Current NFPA 1901 Standard The apparatus manufacturer shall perform the following operation test and ensure that the power source and any devices that are attached to the line voltage electrical system are properly connected and in working order. The test shall be witnessed and the results certified by Underwriters Laboratories. The prime mover shall be started from a cold start condition and the line voltage electrical system loaded to 100 percent of the nameplate rating. The power source shall be operated at 100 percent of its nameplate voltage for a minimum of two (2) hours unless the system meets category certification as defined in the current NFPA 1901 standard. Where the line voltage power is derived from the vehicle's low voltage system, the minimum continuous electrical load as defined in the current NFPA 1901 standard shall be applied to the low voltage electrical system during the operational test. **ONAN PTO GENERATOR** The vehicle shall be equipped with an Onan Protec PTO generator system with a capacity of 25,000 watts at 120/240 VAC, 250/125 amps, single phase. Current frequency shall be stable at 60 hertz. The transmission's PTO port and PTO, or the split shaft PTO, and all associated drive shaft components shall be rated to support the continuous duty torque requirements of the generator's continuous duty rating as stated on the power source nameplate. Where the generator is driven by the chassis engine and transmission through a split shaft PTO, the driving compartment speedometer shall register when the generator drive system is engaged. Where the generator is driven by the chassis engine and transmission through a split shaft PTO and a chassis transmission retarder is furnished, it shall be automatically disengaged for generator operations. The direct drive generator shall be mounted so that it does not change the ramp breakover angle, angle of departure, or angle of approach as defined by other components, and it shall not extend into the ground clearance area. The direct drive generator shall be mounted away from exhaust and muffler areas or provided with a heat shield to reduce operating temperatures in the generator area. **GENERATOR ENGAGEMENT** A "Generator Engaged" indicator shall be provided in the driving compartment to indicate that the generator shift has been successfully completed.		

Specification	Bidder Complies	
	Yes	No
An “OK to Operate Generator” indicator shall be provided in the driving compartment to indicate that the generator is engaged (if not always engaged), the transmission is in the proper gear (if required, automatic transmissions only), and the parking brake is engaged (if applicable). An interlock system shall be provided to prevent advancement of the engine speed in the driving compartment or at any operator’s panel unless the parking brake is engaged, and the transmission is in neutral or the output of the transmission is correctly connected to a pump or generator instead of the drive wheels. **GENERATOR SPLASH GUARD** A powder coat painted splash cover shall be installed to reduce the amount of road spray on the frame mounted PTO generator. A V-ring seal shall also be installed in the cover to provide additional protection against contaminates reaching the generator front seals. **GENERATOR MOUNTING** The generator shall be mounted between the chassis frame rails. The generator mounting brackets shall be fabricated using heavy duty steel tubing, or structural channel. The generator mounting shall be bolted and removable so that the generator can be lowered from under apparatus for service, if necessary. The generator case shall not extend below the bottom edge of the apparatus body. **POWER-TAKE-OFF GENERATOR DRIVE** There shall be a "Hot Shift" power-take-off (PTO) installed on the transmission PTO opening of the chassis. The "Hot Shift" PTO is provided to allow the engagement of the PTO at higher engine RPM speeds. The PTO output shall be connected to the generator through hollow tube type driveline with heavy duty universals. The engagement of the PTO shall be in the chassis cab with a rocker switch and red pilot light to note engagement of the PTO. The power supply to the PTO engagement control shall be wired to the parking brake and a neutral position transmission switch to prevent engagement unless the vehicle is stopped and transmission has been placed in neutral. The installation of the engine, transmission, driven accessories (power takeoffs (PTO), etc.) shall meet the engine and transmission manufacturers’ installation recommendations for the service intended. Model part number shall be Chelsea 277XMFJPB5XD, 129% Ratio. **ENGINE SPEED CONTROL** An engine speed auxiliary control device (high idle switch or throttle) shall be installed to maintain a stable cycle output from generator when the apparatus is		

Specification	Bidder Complies	
	Yes	No
parked. An interlock shall prevent the operation of the engine speed auxiliary control device unless the parking brake is engaged and the transmission is in neutral or park, or the parking brake is engaged and the engine is disengaged from the drive wheels. The engine shall be prevented from regulating its own engine speed during times when engine rpm control is critical for consistent apparatus functions such as generator, water pump, or aerial operation. **GENERATOR MONITORING PANEL** To properly monitor the generator performance and load demand during operation, the generator installation shall be equipped with a full instrument monitor panel. • Generator frequency in hertz • Line 1 current in amperes • Line 2 current in amperes • Generator voltage in volts The program shall support the accumulation of elapsed generator hours. Generator hours shall be displayed. **GENERATOR START** A switch shall be located on the center console control panel to engage the generator. **CIRCUIT BREAKER PANEL LOADCENTER** The load center shall be a Cutler Hammer, BR Series, specifically designed for protection and distribution of 120/240 volt AC, such as lighting and small motor branch circuits. The load center enclosure shall be made of 16 gauge galvanized sheet steel. The galvanized coating provides corrosion protection and as such does not require paint. All trims used on the BR Load center shall be chromate sealed and finished with electro disposition epoxy paint (ASA61) which exceeds requirements for outdoor and indoor applications. A combination surface/flush cover with integral door shall be supplied. The load center shall be UL / CSA listed, **NO EXCEPTIONS** will be allowed. **LIGHT TOWER** Command Light model KL415A-FS (6) FRC Spectra lights.		

Specification	Bidder Complies	
	Yes	No

RECESSED LIGHT TOWER

The specified light tower(s) shall be recessed into the roof of body to allow light tower(s) to be stowed below roof level. The floor and side walls of recessed area shall be fabricated as a separate module from 3/16" aluminum tread plate with an overlapping 3" flange around perimeter roof line. The recessed area shall be completely water tight. All electrical connections made to light tower shall be located on sidewalls for a water tight connection.

The recessed area shall have two (2) water drain holes (in opposite corners) with flexible 1" diameter hose routed to the area below the body.

REAR LED LIGHTING

Two (2) fire research LED Lights shall be mounted at the rear of the Apparatus on each outer corner of the tailboard area. These lights shall be mounted on 360-degree removable fire research tri-pod model 560 with quick removal mounts. Control switches shall be mounted on each fixture. These lights will have a Hubbell L5-15, 15 amps, 120 volt, twist lock connector body on the end of the cord for the fixture and a compatible outlet installed directly adjacent to the mount position of the lights

OUTLETS AND CIRCUITS

The generator and or shore power shall supply the 120/240 volt electrical equipment and outlets outlined below. Proper circuit protection shall be installed as noted:

Two (2) 120 volt exterior outlets on each side of the front of the body.

- The outlet receptacle(s) shall be 20 amp, twist-lock (NEMA L5-20R)

Two (2) 120 volt exterior outlets, one (1) each side near rear wheel well area.

- The outlet receptacle(s) shall be 20 amp, twist-lock (NEMA L5-20R).

Two (2) 120 volt exterior outlets on each side of the rear of the body.

- The outlet receptacle(s) shall be 20 amp, twist-lock (NEMA L5-20R).

ELECTRIC CORD REELS

Furnished with the 120 volt AC electrical system shall be two (2) Akron, cord reels. Each reel shall be provided with a 12-volt electric rewind switch, that is guarded to prevent accidental operation and labeled for its intended use. The switch shall be protected with a fuse and installed at a height not to exceed 72 inches above the operators standing position

The reel shall be capable holding 12/3 600 volt cable or 10/3 600 volt cable.

The reel shall include the following features:

- Heavy-duty construction for durability
- All stainless steel hardware
- Rolled disc edges
- Live slip ring design

Specification	Bidder Complies	
	Yes	No
- Includes the gang box attached to the commutator - Universal frame with four motor locations - Meets NFPA requirements for reel overage of 10% The exterior finish of the reel(s) shall be powder coated silver from the reel manufacturer. A captive roller assembly to be provided to aid in the payout and loading of the reel. A ball stop shall be provided to prevent the cord from being wound on the reel. A label shall be provided in a readily visible location adjacent to the reel. The label shall indicate current rating, current type, phase, voltage and total cable length. The cord reel should be configured with three (3) conductors. **REEL WARRANTY** The electric reel shall come with a five (5) year warranty provided by the reel manufacturer. **CORD** Provided for electric distribution shall be two (2) lengths, one for each reel, of 200 feet of yellow 10/3 electrical cord, weather resistant 105 degree C to -50 degree C, 600 volt jacketed SOOW cord. A Hubbell L5-15, 15 amps, 120 volt, and twist lock connector body shall be installed on the end of the cord **PORTABLE JUNCTION BOX** There shall be Two (2)-120 vac, 20 amp twist lock receptacles and Two (2)-120 vac, 20 amp straight blade (household) receptacle provided in a portable junction box. The junction box shall be of weatherproof construction and have flip up lids lined with soft neoprene rubber at each outlet opening. Box shall be fitted with a quarter inch thick, polypropylene faceplate which is brightly backlit with a twenty-five watt lamp, making the junction box easy to locate. The junction box shall be connected to the cord on the reel with a twist lock connector body. A total of two (2) black in color mounting brackets shall be provided and installed inside the front forward left compartments direct beneath each installed cord reel. **RESCUE BODY CONSTRUCTION** The rescue body shall be of all aluminum construction. The body shall use .125" (3 mm) and .188" (5 mm) 5052 aluminum for the front, rear and side panels. Any compartment dividers and compartment backs shall also be constructed of aluminum. The structural support framing shall be 6061 aluminum alloy tubing with dimensions of 2.00" (51 mm) square with a wall thickness of .125" (3 mm). All exterior body corners shall be 3.00" (76 mm) radius aluminum, corrosion resistant alloy 6061 extrusions. The roof and		

Specification	Bidder Complies	
	Yes	No
corner extrusions shall be reinforced with interconnecting 90 degree angle supports at all stress points. The body shall be properly welded into a unitized construction. Proper reinforcing and supports shall be utilized throughout all construction to ensure strength and rigidity. **MODULE FABRICATION AND DESIGN** The substructure for the body shall be an integral part of the body construction. The body shall be built as a separate complete module prior to being mounted onto the chassis. **BODY AND COMPARTMENT SUPPORT** The body shall be supported by 2.00" (51 mm) x 2.00" (51 mm) x .125" (3 mm) wall aluminum tubing. The cross sill tubes shall be spaced approximately 12.00" (305 mm) on center and interconnected to the body from the front to rear. A 1.00" (25 mm) x 2.00" (51 mm) aluminum bar shall be used as a stringer and shall be welded to the cross sills. A structural mounting plate 0.75" (19 mm) x 6.00" (153 mm) x the length of body shall be provided as the main mounting structure. A rubber isolator mounting system shall be incorporated into this mounting structure to support the body, provide dissimilar metal protection and reduce the transmission of torsional stress to the body. This system shall also allow the body to be removed from the chassis as an entire unit. The bottom of each lower compartment floor shall be supported by an aluminum under-body support system. This support system shall be constructed vertical and horizontal supports that are 1.00" (25mm) x 2.00" (51 mm) tube with a wall thickness of .125" (3mm). The compartment floors shall be welded to the underbody support substructure. **ROOF CONSTRUCTION** The roof shall be integral with the body construction. The roof shall be constructed of .125" (3 mm) bright aluminum treadplate and supported by 2.00" (51 mm) square .125" (3 mm) wall tubing welded in place approximately 12.00" (305 mm) on center. The roof shall be further reinforced with angle tie members welded to the cross tubes. The roof perimeters shall be constructed of a 3.00" (76 mm) radius extrusion with an integral drip molding. The roof extrusion shall also have an inset allowing the roof panel to be recessed into the extrusion giving further support and sealing effect at the outside edge. The roof panel shall be fastened to the roof extrusions and supports. All roof seams shall be sealed to keep the compartment interiors weather proof. **BODY WARRANTY** A copy of the fire apparatus manufacturer's warranty shall be included with the bid. The warranty shall state that the body shall be free of structural failures caused by defective design or workmanship for a warranty period of ten (10) years from the date the new vehicle is first delivered or 100,000 miles, whichever occurs first, and that defective parts under the warranty shall be repaired or replaced without charge to the original purchaser.		

Specification	Bidder Complies	
	Yes	No
BODY STYLE The body shall be a non-walk in type with roll-up doors. The body shall be constructed of aluminum. **BODY LENGTH** The length of the body shell shall be 18.00' from front to back, excluding bumpers, steps or other ancillary components. Individual compartment dimensions shall be as described within the text for each compartment. **ROOF CONFIGURATION** The roof shall be constructed such that hatch compartments and other equipment can be installed in a recessed area of the roof. Hatch Compartments Four (4) hatch compartments - two (2) each side - shall be provided on the body roof, positioned toward the rear. The compartments shall be about 26.50" wide x 14.25" deep. Each compartment shall have a maximum capacity of 300 lbs (1200 lbs total). The hatch compartment doors shall hinge on the outboard side and be held open with gas cylinder struts. A chrome plated lift handle shall be provided on each hatch door. A "plunger & socket" style of latch shall hold the door in the closed position. A light shall be mounted to the underside of each hatch door. The light shall be recessed, rubber mounted, have a diffuser lens and have a shock protected bulb. Also, it shall be wired to an automatic door switch and to the "open door" indicator light inside the cab. The wall design toward the exterior of the body shall be a double wall to prevent equipment inside the hatch compartment from denting the outside painted surface of the body. 2'' access holes will be provided in the forward two compartments into the body to accommodate the running of air lines. **RECESSED WALKWAY** A recessed walkway shall be centered on the roof between the hatch compartments. The walkway shall be about 30.00" wide x 14.25" deep and shall run the length of the body up to the recessed area for the light mast or equipment storage. The floor of the walkway shall be constructed of bright aluminum non-slip tread plate and reinforced with aluminum tubing supports. Drain holes, 1.00" in diameter, shall be provided in the walkway. They shall be routed to drain below the body. A chrome plated hooded step lights shall be provided on each side to properly illuminate the walkway. The lights shall be controlled by the perimeter light switch.		

Specification	Bidder Complies	
	Yes	No
RECESSED STORAGE AREA A transverse recessed area shall be provided in the forward section of the roof. This area shall be large enough to install a typical light tower or other such equipment. The floor of this recessed area shall be constructed of .125" bright aluminum tread plate. Drain holes that are 1.00" in diameter shall be provided and shall be routed to drain below the body. **ROOF ACCESS LADDER** A ladder shall be provided at the rear of the body on the driver's side for access to the top of the body. The ladder shall extend above the roof line to provide easier and safer maneuverability both on and off the ladder. The ladder rails and rungs shall be constructed of 1.25" diameter non-slip extruded aluminum handrail material. The ladder rungs shall be bolted to the ladder rails with a center mounted solid rod inside the extruded aluminum non-slip rung material. **WALKWAY EXTENSION** A walkway extension constructed of bright aluminum non-slip tread plate shall be provided at the top/rear of the body for better access to the top of the body and the hatch compartments. The extension shall be the width of the walkway and designed to assure secure entrance and egress to the top. **ROLL-UP DOOR, SIDE COMPARTMENTS** There shall be seven (7) compartment doors installed on the side compartments, double faced, aluminum construction, painted the same color as the lower portion of the body and manufactured by A&A Manufacturing (Gortite). Lath sections shall be an interlocking rib design and shall be individually replaceable without complete disassembly of door. Between each slat at the pivoting joint shall be a PVC inner seal to prevent metal to metal contact and prevent dirt or moisture from entering the compartments. Seals shall allow door to operate in extreme temperatures ranging from plus 180 to minus 40 degrees Fahrenheit. Side, top and bottom seals shall be provided to resist ingress of dirt and weather and be made of Santoprene. All hinges, barrel clips and end pieces shall be nylon 66. All nylon components shall withstand temperatures from plus 300 to minus 40 degrees Fahrenheit. Hardened plastic shall not be acceptable. A polished stainless steel lift bar to be provided for each roll-up door. The lift bar shall be located at the bottom of door and have latches on the outer extrusion of the doors frame. A ledge shall be supplied over lift bar for additional area to aid in closing the door. Door(s) shall be constructed from an aluminum box section. The exterior surface of each slat shall be flat. The interior surfaces shall be concave to provide strength and prevent loose equipment from jamming the door from inside.		

Specification	Bidder Complies	
	Yes	No
To conserve space in the compartment(s), the spring roller assembly shall not exceed 3.00" in diameter. A roll-up door that retracts below the compartment ceiling (garage door style) shall not acceptable. The header for the roll-up door assembly shall not exceed 4.00".A heavy-duty magnetic switch shall be used for control of open compartment door warning lights. **LEFT SIDE FORWARD COMPARTMENTS** Located directly behind the cab - forward of the rear axle - shall be two (2) roll-up door compartments. Both compartments shall be the same size as described below. The dimensions shall be 50.75" wide x 67.00" high x 24.50" deep at the floor level. The area over the frame rails shall be 50.75" wide x 49.00" high and shall extend through to the right side of the body. These compartments are transverse and shall extend from the left side to the right side of the body. Total depth with the doors closed shall be 92.13". The compartment door openings shall be 45.50" wide x 58.00" high. Each transverse compartment shall have a maximum capacity of 1500 lbs - 500 lbs on each side and 500 lbs on the center section over the frame rails. Compartment that is forward of the wheel shall have mounted Fill Station - Bauer - Class 2 (CFS5.5-1SX4X4) and shall be connected to 4 ASME 6,000 PSI cylinders with CGA 702 valves that are mounted in the forward two upper compartments two bottle in each of the two. **LEFT OVER WHEEL COMPARTMENT** Located above the rear wheels shall be a roll-up door compartment. The compartment dimensions shall be 62.38" wide x 39.25" high. This compartment is transverse, and the depth shall extend through to the right side of the body. Total depth with the doors closed shall be 92.13". The compartment door opening shall be 54.50" wide x 31.25" high. This transverse compartment shall have a maximum capacity of 1000 lbs - 500 lbs on each side. **LEFT REAR COMPARTMENT** Located behind the rear wheels shall be a roll-up door compartment. The compartment dimensions shall be 48.25" wide x 67.00" high x 24.50" deep with the door closed. The compartment door opening shall be 45.50" wide x 58.00" high. The compartment shall have a maximum capacity of 500 lbs. **RIGHT SIDE FORWARD COMPARTMENTS** Located directly behind the cab - forward of the rear axle - shall be two compartments. Both compartments shall be the same size as described below.		

Specification	Bidder Complies	
	Yes	No
The dimensions shall be 50.75" wide x 67.00" high x 24.50" deep at the floor level. The area over the frame rails shall be 50.75" wide x 49.00" high and shall extend through to the right side of the body. These compartments are transverse and shall extend from the left side to the right side of the body. Total depth with the doors closed shall be 92.13". The compartment door openings shall be 45.50" wide x 58.00" high. **RIGHT OVER WHEEL COMPARTMENT** Located above the rear wheels shall be a compartment. The compartment dimensions shall be 62.38" wide x 39.25" high. This compartment is transverse, and the depth shall extend through to the opposite side of the body. Total depth with the doors closed shall be 92.13". The compartment door opening shall be 54.50" wide x 31.25" high. **RIGHT REAR COMPARTMENT** Located behind the rear wheels shall be a roll-up door compartment. The compartment dimensions shall be 48.25" wide x 67.00" high x 24.50" deep with the door closed. The compartment door opening shall be 45.50" wide x 58.00" high. The compartment shall have a maximum capacity of 500 lbs. **REAR COMPARTMENT** A compartment at the rear shall be provided. The compartment dimensions shall be 43.00" wide x 67.00" high x 26.00" deep in the lower section and 51.13" deep in the upper section. The door opening shall be 37.50" wide x 58.00" high. HYDRAULIC ELECTRIC PUMP AND TOOL CONNECTIONS A hydraulic pump shall be installed in the compartment to be ran off the generator and be capable of running two hydraulic tools at the same time and be plumbed to both rear remote mounted tool connectors and both front bumper remote mounted tool connectors. Two vertical slide out tool boards will be mounted in the bottom of the rear compartment to accommodate the mounting of rescue tools that are pre-connected to the rear hose reels. The tool boards will be of sufficient size to mount other non-pre-connected tools as well. **HYDRAULIC EXTRICATION TOOLS** The vendor will provide a full complement of hydraulic extrication tools. The extrication tools will have a minimum specification of the following: • 10,000 psi operating system • System shall be rated for new car technology		

Specification	Bidder Complies	
	Yes	No

• Spreader with a minimum of a 28" spread and minimum spread force of 65,000 psi
• Large cutter that has been rated by NFPA in the 5 cutting categories with a minimum rating of a "9" in all categories.
• Two Rams with extensions
  ➢ One ram will have a minimum extended length of 24"
  ➢ One ram will have a minimum extended length of 48"
  ➢ Extensions must add a minimum of 12"
• Portable power unit capable of operating two tools simultaneously
• Four 25' hydraulic hose lines
• Any and all additional accessories required to ensure optimal operation of all equipment and ability to connect to specified operating system for the apparatus and for the portable power unit.
 	
<u>REAR COMPARTMENT DOOR</u>
A roll-up door shall be installed on the rear compartment. It shall be a double faced, aluminum construction, and shall be painted the same color as the lower body of the apparatus and manufactured by A&A Manufacturing (Gortite).
 	
Lath sections shall be an interlocking rib design and shall be individually replaceable without complete disassembly of door.
 	
Between each slat at the pivoting joint shall be a PVC inner seal to prevent metal to metal contact and prevent dirt or moisture from entering the compartments. Seals shall allow door to operate in extreme temperatures ranging from plus 180 to minus 40 degrees Fahrenheit. Side, top and bottom seals shall be provided to resist ingress of dirt and weather and be made of Santoprene.
 	
All hinges, barrel clips and end pieces shall be nylon 66. All nylon components shall withstand temperatures from plus 300 to minus 40 degrees Fahrenheit. Hardened plastic shall not be acceptable.
 	
A A polished stainless steel lift bar to be provided for each roll-up door. The lift bar shall be located at the bottom of door and have latches on the outer extrusion of the doors frame. A ledge shall be supplied over lift bar for additional area to aid in closing the door.
 	
Door(s) shall be constructed from an aluminum box section. The exterior surface of each slat shall be flat. The interior surfaces shall be concave to provide strength and prevent loose equipment from jamming the door from inside.		

Specification	Bidder Complies	
	Yes	No
To conserve space in the compartment(s), the spring roller assembly shall not exceed 3.00" in diameter. A roll-up door that retracts below the compartment ceiling (garage door style) shall not acceptable. The header for the roll-up door assembly shall not exceed 4.00". A heavy-duty magnetic switch shall be used for control of "open compartment door" warning lights. **ELECTRONIC/KEYED COMPARTMENT DOOR LOCKS** An electronic/ keyed lock shall be furnished for all compartment doors. All door compartment electronic locks will be wired to activate with the apparatus door locks. Each compartment will additionally have a keyed override to the electronic lock, these locks shall all be keyed alike **COMPARTMENT AND SHELF RUBBER MATTING** Rubber matting shall be installed on the floor of every compartment, shelf bottom and provided tray of the apparatus to provide for proper ventilation. This rubber matting shall be heavy duty for long term duty and shall be black in color **REAR BUMPER** A rear bumper/tailboard shall be provided that is an integral part of the rear body substructure. The bumper shall provide a stepping surface of approximately 12.00" deep x 91.00" wide. It shall be covered with a bright aluminum treadplate deck. Two (2) 28" long handrails shall be provided, one (1) on each side of the rear compartment. **REAR WALL, SMOOTH ALUMINUM** The rear wall shall be smooth aluminum. **CHEVRON STRIPING, REAR** There shall be alternating chevron striping located on the rear-facing vertical surface of the apparatus. The rear surface, excluding the rear compartment door, shall be covered. The colors shall be red and bright Yellow diamond grade. Each stripe shall be 6.00" in width. This shall meet the requirements of NFPA 1901, 2009 edition, which states that 50% of the rear surface shall be covered with chevron striping. **TOW EYES** Two (2) rear painted tow eyes shall be located at the rear of the apparatus mounted to the rear substructure below the body which is attached directly to the chassis frame rails. The inner and outer edges of the tow eyes shall have a radius.		

Specification	Bidder Complies	
	Yes	No
COMPARTMENTATION Body and compartments shall be fabricated of .125", 5052-H32 aluminum. Side compartments shall be an integral assembly with the rear fenders. Circular fender liners shall be provided for prevention of rust pockets and ease of maintenance. Compartment flooring shall be of the sweep out design with the floor higher than the compartment door lip. The compartment door opening shall be framed by flanging the edges in 1.75" and bending out again .75" to form an angle. Drip protection shall be provided above the doors by means of a formed aluminum channel. The top of the body shall be covered with bright aluminum treadplate to form the roof. All screws and bolts which protrude into a compartment shall have acorn nuts on the ends to prevent injury. **ALUMINUM TREADPLATE ON FRONT OF BODY** The front sheet of the body shall have aluminum tread plate installed. A three (3)-piece installation shall provide top-to-bottom coverage on each side at a width of 20.00", and a center piece that provides coverage from the top of the body to below the rear window line of the cab. **BODY SUPPORT SYSTEM** Due to the severe loading requirements of this rescue truck, a method of body and compartment support suitable for the intended load shall be provided. The backbone of the support system shall be the chassis frame rails which is the strongest component of the chassis and is designed for sustaining maximum loads. An aluminum framework structure shall be mounted on the top of the frame rails and a rubber isolator system shall support the body to create a floating structure which shall dampen torsional stresses transmitted to the body. The isolators used for the floating structure shall be neoprene elastomer isolators. These isolators shall reduce the natural flex stress of the chassis from being transmitted to the body. The isolators shall have a broad load range, proven viability in vehicular applications, be of a fail-safe design and allow for all necessary movement in three (3) transitional and rotational modes. **AGGRESSIVE WALKING SURFACE** All exterior surfaces designated as stepping, standing, and walking areas shall comply with the required average slip resistance of the current NFPA standards.		

Specification	Bidder Complies	
	Yes	No
COMPARTMENT VENTING Body compartments shall have adequate ventilation. Louvers and cross-flow ventilation shall be utilized. A louvered plate shall be fastened over a cutout in the compartment walls at the front and rear side compartments. They shall be positioned to provide the proper airflow to the outside and to prevent water from dripping into the compartment. **COMPARTMENT LIGHTING** There shall be seven (7) compartments with LED compartment light strips. The strips shall be centered vertically along each side of the door framing. The compartments with these strip lights shall be located P 1, 2, 3, R1, D1, 2, &3. Any remaining compartments shall include 6.00" diameter Truck-Lite, Model: 79384 light in each enclosed compartment. Each light shall have a number 1076 one filament, two wire bulb. Opening the compartment door shall automatically turn the compartment lighting on. **ADJUSTABLE SHELF** There shall be two (2) shelves with a capacity of 500 pounds provided full width of the transverse engineer compartment. The shelf construction shall consist of .188" aluminum with 2.00" sides. Each shelf shall be painted to match the compartment interior. Each shelf shall be infinitely adjustable by means of a threaded fastener, which slides in a track. The shelves shall be held in place by .12" thick stamped plated brackets and bolts. **ADJUSTABLE SHELVES** There shall be nine (9) shelves, with a capacity of 500 pounds provided. The shelf construction shall consist of .188" thick brushed aluminum with 2.00" sides. Each shelf shall be infinitely adjustable by means of a threaded fastener, which slides in a track. The shelves shall be held in place by .12" thick stamped plated brackets and bolts. Exact location to be determined in the pre-construction conference **PULLOUT TOOL BOARDS** Four full compartment height pull out tool boards shall be provided. Slides shall be General Device ball bearing type for ease of operation and years of dependable service. Automatic locks shall be provided for both the "in" and "out" positions. The trip mechanism for it shall be located at the front of the tray for ease of use with a gloved hand. Exact location to be determined in the pre-construction conference		

Specification	Bidder Complies	
	Yes	No
PULL-OUT TRAY There shall be four (4) slide-out trays with 2.00" sides and a minimum capacity of 750 pounds provided. Capacity rating shall be in the extended position. Slides shall be General Device ball bearing type for ease of operation and years of dependable service. Automatic locks shall be provided for both the "in" and "out" positions. The trip mechanism for it shall be located at the front of the tray for ease of use with a gloved hand. Heavy-duty steel angle iron assembly shall support the body under the compartment floor. It shall be attached to the chassis frame for load transfer and to reduce stress on body. Exact location to be determined in the pre-construction conference. **RUB RAIL** Bottom edge of the side compartments shall be trimmed with a bright aluminum extruded rub rail. Trim shall be 2.12" high with 1.38" flanges turned outward for rigidity. The rub rails shall not be an integral part of the body construction, which allows replacement in the event of damage. **BODY FENDER CROWNS** Stainless steel fender crowns shall be provided around the rear wheel openings. A rubber welting shall be provided between the body and the crown to seal the seam and restrict moisture from entering. A dielectric barrier shall be provided between the fender crown fasteners (screws) and the fender sheet metal to prevent corrosion. **AIR BOTTLE STORAGE** A total of four (4) air bottle compartments shall be provided, two (2) each side of the body. The air bottle compartment shall be in the form of a PVC round tube to accommodate different size air bottles. A Cast Products door with latch shall be provided to contain the air bottle. **SCBA AIR FILL STATION** Air fill station, cascade bottles and booster pump An air fill station shall be mounted in the D4 compartment and plumbing provisions shall be made to connect it to 4 ASME cascade bottles. Two each mounted in the upper front top compartments. A booster pump shall be mounted behind the air fill station in compartment D4 all plumbing must be completed to make this system work. Air Fill station shall be a Bauer – class 2. That fills one SCBA bottle and has controls with gauges and valves for 4 cascade bottles and a refill connection with control valve and bleeder for refilling cascade bottles. It shall be a 6,000 PSI system. Booster pump is a Haskel 6,000 PSI booster pump part #58985-2 Fill station is a Bauer Part # CFS5.5-1SX4X4		

Specification	Bidder Complies	
	Yes	No

ROPE TIE-OFF OR PORTABLE WINCH RECEIVERS

The completed unit shall have an integrated receiver system for use with rope rescue accessories and/or electric winch components when specified. Each receiver shall have the following load rating:

	STRAIGHT PULL	SAFETY FACTOR
Rope Tie Off:	600 LBS.	15:1
Winch:	8,000 LBS	4:1

The following items shall be provided to accomplish rope rescue and/or portable winch operations:

Two (2) rope tie off anchor accessories shall be provided with the completed vehicle. Each anchor accessory shall include a hitch pin to lock it in place. The tie off anchor accessories shall have an eyelet for use with a rope rescue carabineer. A mounting bracket shall be provided to store each rope tie off accessory in a body compartment as close to receiver as possible.

There shall be one (1) receiver tube(s) located on the driver's side of the body in the forward portion of the wheel well panel for use with rope tie-off.
There shall be one (1) rubber cover / plug for the driver's side receiver.

There shall be one (1) receiver tube(s) located on the passenger side of the body in the forward portion of the wheel well panel for use with rope tie-off.
There shall be one (1) rubber cover / plug for the passenger side receiver.

There shall be one (1) receiver tube(s) located at the front bumper for use with rope tie-off accessory.
There shall be one (1) rubber cover / plug for the front receiver.

There shall be one (1) receiver tube(s) located at the rear bumper for use with rope tie-off accessory.
There shall be one (1) rubber cover / plug for the rear receiver

There shall be a 12 Volt electric plug near all three locations suitable for plugging in a winch.

WHEEL CHOCKS

There shall be two (2) pair of folding Ziamatic SAC-44-E, aluminum alloy, and Quick-Choc wheel blocks with easy-grip handle provided.

Specification	Bidder Complies	
	Yes	No

WHEEL CHOCK BRACKETS
There shall be two (2) pair of Ziamatic SQCH-44-H horizontal mounting wheel chock brackets provided for the Ziamatic SAC-44-E folding wheel chocks. The brackets shall be mounted on each side of the apparatus just in front of the rear axle.

HAND HELD LIGHT
There shall be two (2) Streamlight LiteBox LED lights with an orange thermoplastic body provided. One shall be mounted on the front wall of the front compartment of each side of the apparatus. Exact locations determined during the pre-construction conference

LOOSE EQUIPMENT
The following equipment shall be furnished with the completed unit:

- One (1) bag of chrome, stainless steel, or cadmium plated screws, nuts, bolts and washers, as used in the construction of the unit

PAINT, DECALS AND STRIPING

COMMERCIAL CHASSIS PAINT
The chassis shall be painted by the chassis manufacturer. It shall remain the color and commercial quality finish as provided. The primary color shall be PPG Red #70853

TWO-TONE CAB

The cab shall be painted two-tone by the apparatus manufacturer. The top portion of the cab from the bottom of the windshield up shall be painted to match Chicago black. The lower portion shall be painted PPG Red#70853.

PAINT
The exterior custom body painting finishing process as follows:

Manual Surface Preparation - All exposed metal surfaces on the custom body shall be thoroughly cleaned and prepared for painting. Surfaces that shall not be painted include all chrome plated, stainless steel, anodized aluminum and bright aluminum tread plate. Each imperfection on the exterior metal surface shall be removed or filled and then sanded smooth for a smooth appearance. All seams shall be sealed before painting.

Chemical Cleaning and Treatment - The metal surfaces shall be properly cleaned using an acid etching system. Surfaces are chemically cleaned to remove all dirt, oil, grease and metal oxides to ensure the subsequent coatings bond well. An ultra-pure water final rinse shall be applied to all metal surfaces, excluding undercarriage components, at the conclusion of the metal treatment process.

Sealer Primer Coat - A two (2) component sealer primer coat shall be applied.

Specification	Bidder Complies	
	Yes	No
Topcoat Paint - Urethane base coat shall be applied to opacity for correct color matching. Clear coat - Two (2) coats of an automotive grade two (2) component urethane shall be applied. Lap style doors shall be clear coated to match the body. Roll-up doors shall not be clear coated and the standard roll-up door warranty shall apply. All removable items such as brackets, compartment doors, door hinges, trim, etc. shall be removed and painted separately to insure paint behind all mounted items. Body assemblies that cannot be finish painted after assembly shall be finish painted before assembly. The chassis shall be painted by the chassis manufacturer, and shall remain the commercial grade finish as provided. To ensure a good color match between the body and chassis, the apparatus manufacturer and chassis manufacturer shall have a mutually preapproved paint color program. The apparatus shall be painted candy apple red. Prior to reassembly and reinstallation of lights, handrails, door hardware and any miscellaneous body items, an isolation tape or gasket material must be used to prevent damage to the finish painted surfaces (no exceptions). A nylon washer shall be installed under each acorn nut or metal screw that is fastened directly to a painted body surface. **PAINT - ENVIRONMENTAL IMPACT** Contractor shall meet or exceed all current State (his) regulations concerning paint operations. Pollution control shall include measures to protect the atmosphere, water and soil. Controls shall include the following conditions: - Topcoats and primers must be chrome and lead free. - Metal treatment chemicals must be chrome free. The wastewater generated in the metal treatment process must be treated to remove any other heavy metals. - Particulate emissions from painting operations must be collected by a dry filter or water wash process. - Solvents used in clean-up operations must be collected, sent off-site for distillation and returned for reuse. Additionally, the finished apparatus shall not be manufactured with or contain products that have ozone depleting substances. Contractor shall, upon demand, present evidence that his manufacturing facility meets the above conditions and that it is in compliance with his State EPA rules and regulations. **PAINT CHASSIS FRAME ASSEMBLY** The chassis frame assembly shall be painted black by the chassis manufacturer. It shall remain the commercial grade finish as provided. **COMPARTMENT INTERIOR PAINT** The interior of compartments shall be painted with a gray spatter type paint.		

Specification	Bidder Complies	
	Yes	No

REFLECTIVE STRIPES
Three (3) reflective stripes shall be provided across the front of the vehicle and along the sides of the body. The reflective band shall consist of a 1.00" black stripe at the top with a 1.00" gap then a 6.00" gold stripe with a 1.00" gap and a 1.00" black stripe on the bottom.

The reflective vinyl band shall be provided across the front bumper.

CHEVRON STRIPING, REAR
There shall be alternating chevron striping located on the rear-facing vertical surface of the apparatus. Covered surfaces shall include the exterior rear wall. Rear compartment doors, entry doors, or walkway areas shall not be covered.

The colors shall be red and fluorescent yellow diamond grade.

Each stripe shall be 6.00" in width.

This shall meet the requirements of NFPA 1901, 2009 edition, which states that 50% of the rear surface shall be covered with chevron striping.

REFLECTIVE STRIPE, CAB DOORS
A ruby red reflective stripe shall be provided on the interior of each cab door.

This stripe shall be a minimum of 96.00 square inches and shall meet the NFPA 1901 requirement.

LETTERING
The lettering shall be totally encapsulated between two (2) layers of clear vinyl.

LETTERING
Twenty-one (21) to forty (40) printed effect gold leaf lettering, 1.00" high, with highlight and shade shall be provided.

DECAL INSTALLATION
There shall be two (2) pair of decals applied by the apparatus manufacturer.

WARRANTIES AND MANUALS

CD MANUAL, BODY PARTS ONLY
A custom parts manuals for the factory installed parts only shall be provided in CD format with the completed unit.

The manual shall contain the following:

- Job number
- Part numbers with full descriptions
- Table of contents
- Parts section sorted in functional groups reflecting a major system, component, or assembly
- Parts section sorted in Alphabetical order
- Instructions on how to locate parts

Specification	Bidder Complies	
	Yes	No
The manual shall be specifically written for the body model being purchased. It shall not be a generic manual for a multitude of different bodies. **MANUALS, SERVICE** A CD format service manual supplement containing parts and service information on factory installed components shall be provided with the completed unit. The manual shall be specifically written for the unit being purchased. It shall not be a generic manual for a multitude of different units. **MANUAL, CHASSIS OPERATION** One (1) chassis operation (manufacturer's standard) shall be provided with the completed unit. **ONE (1) YEAR MATERIAL AND WORKMANSHIP** Each new piece of apparatus shall be provided with a minimum one (1) year basic apparatus material and workmanship limited warranty. The warranty shall cover such portions of the apparatus built by the manufacturer as being free from defects in material and workmanship that would arise under normal use and service. A copy of the warranty certificate shall be submitted with the bid package (No Exception). **CHASSIS WARRANTY** The chassis warranty shall be for a total of **two (2) years/unlimited mileage.** **PAINT WARRANTY** The commercial chassis manufacturer's paint warranty shall apply to the paint on the chassis only. **CAMERA SYSTEM WARRANTY** A fifty four (54) month warranty shall be provided for the camera system**.** **TRANSMISSION WARRANTY** The transmission shall have a **five (5) year/unlimited mileage** warranty covering 100 percent parts and labor. The warranty to be provided by Allison Transmission and not apparatus builder. **TEN (10) YEAR STRUCTURAL INTEGRITY** Each new piece of apparatus shall be provided with a ten (10) year material and workmanship limited warranty on the apparatus body. The warranty shall cover such portions of the apparatus built by the manufacturer as being free from defects in material and workmanship that would arise under normal use and service. A copy of the warranty certificate shall be submitted with the bid package (No Exception).		

Specification	Bidder Complies	
	Yes	No
ROLL UP DOOR MATERIAL AND WORKMANSHIP WARRANTY A Gortite roll-up door limited warranty shall be provided. The mechanical components of the roll-up door shall be warranted against defects in material and workmanship for the lifetime of the vehicle. A six (6) year limited warranty shall be provided on painted and satin roll up doors. A copy of the warranty certificate shall be submitted with the bid package. **TWO (2) YEAR GENERATOR MATERIAL AND WORKMANSHIP WARRANTY** A Harrison Hydra-Gen generator 2 year limited warranty shall be provided. **TEN (10) YEAR PRO-RATED PAINT AND CORROSION** Each new piece of apparatus shall be provided with a ten (10) year pro-rated paint and corrosion limited warranty on the apparatus body. The warranty shall cover painted exterior surfaces of the body to be free from blistering, peeling, corrosion, or any other adhesion defect caused by defective manufacturing methods or paint material selection that would arise under normal use and service. A copy of the warranty certificate shall be submitted with the bid package (No Exception). **THREE (3) YEAR MATERIAL AND WORKMANSHIP** The gold leaf lamination shall be provided with a three (3) year material and workmanship limited warranty. The warranty shall cover the gold leaf lamination as being free from defects in material and workmanship that would arise under normal use and service. A copy of the warranty certificate shall be submitted with the bid package (No Exception). **VEHICLE STABILITY CERTIFICATION** The fire apparatus manufacturer shall provide a certification stating the apparatus complies with NFPA 1901, current edition, section 4.13, Vehicle Stability. The certification shall be provided at the time of bid. **CAB INTEGRITY** The cab has been tested to and passed the following standards: - ECE Regulation No.29 - SAE J2422 Cab Roof Strength Evaluation - Quasi-Static Loading Heavy Trucks. **AMP DRAW REPORT** The bidder shall provide, at the time of bid and delivery, an itemized print out of the expected amp draw of the entire vehicle's electrical system. The manufacturer of the apparatus shall provide the following: 1) Documentation of the electrical system performance tests.		

Specification	Bidder Complies	
	Yes	No
2) A written load analysis, which shall include the following: A) The nameplate rating of the alternator. B) The alternator rating under the conditions specified per: Applicable NFPA 1901 or 1906 (Current Edition). C) The minimum continuous load of each component that is specified per: Applicable NFPA 1901 or 1906 (Current Edition). D) Additional loads that, when added to the minimum continuous load, determine the total connected load. E) Each individual intermittent load. All of the above listed items shall be provided by the bidder per the applicable NFPA 1901 or 1906 (Current Edition). **WARRANTY PERIOD** Provided such goods are operated and maintained in accordance with Onan's written instructions, Onan warrants that the Protec YDCR series PTO 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. ***MARK BID ENVELOPES: "BID #2019-05, 3:00 P.M., Thursday, March 07, 2019, Heavy Rescue Fire Apparatus"***		