Durham Fire Department
51 College Road ■Durham, New Hampshire ■03824-3585
Phone 603-862-1426 ■Fax 603-862-1513
fire@ci.durham.nh.us

NEW PUMPER SPECIFICATIONS

FOR

DURHAM FIRE DEPARTMENT

DURHAM, NEW HAMPSHIRE

March 22, 2017

INSTRUCTIONS TO BIDDERS

NOTICE

The Town of Durham, New Hampshire, hereinafter referred to as the "town", is interested in receiving proposals from qualified individuals or companies that meet the requirements as set forth in this Request for Proposal (RFP).

The town is requesting proposals for the construction and delivery of a Fire Pumper. Price provided shall include delivery to the Town of Durham.

All RFP'S shall be submitted no later than 3:00 p.m. on DATE: April 24, 2017 to Chief Corey Landry, Durham Fire Department, 51 College Rd. Durham NH, 03824. SEALED bid envelopes shall be clearly labeled Bid: 2017: FD-Pumper.

PURPOSE

Through these specifications it is the intent of the Purchaser to secure an apparatus to withstand the duty encountered in the firefighting and rescue apparatus service.

The apparatus shall be constructed with due consideration to the nature and distribution of the load to be sustained, and to the characteristics of the service.

All parts not specifically mentioned herein, but which are necessary in order to furnish a complete fire apparatus, shall be furnished and shall conform to the best practices known to the emergency vehicle industry.

Subletting any part of the fabrication, painting, or finishing of this apparatus will not be acceptable. The apparatus body is to be built completely by the Bidder or the bid will be excluded from consideration.

Where these specifications require specific brand names, model numbers, dimensions or capacities of components, these shall be supplied, as each has been selected carefully for reliability and availability of replacement on a local basis.

Due to the importance of public safety associated with firefighting, and to assure a reasonably trouble free life for the body being purchased, bidders shall have at least thirty (30) years of experience manufacturing and field testing aluminum bodies and cabs for emergency vehicle duty. Bidders of apparatus that have not manufactured and field tested such apparatus for at least thirty (30) years shall be excluded from consideration. The proposals of such bidders will not be considered.

Bidders shall state in the proposal, the number years of experience they have building aluminum body emergency vehicles as well as years the dealership has operated in the New England region.

The apparatus and all major components shall be manufactured in the United States.

In the interest of insuring prompt service and support of the apparatus after the sale the following criteria must be met:

- Service facilities and service vehicle(s) available for prompt repair.

- Service personnel have Emergency Vehicle Technician and/or ASE certification.

- Dealership principal(s) shall be engaged in the operations of the enterprise on a full-time basis.

REGULATION COMPLIANCE

Where applicable, Bidder's specifications must fully comply with requirements of the respective N.F.P.A. recommendations, and all State and Federal Department of Transportation vehicle regulations at contract signing.

In the event the apparatus fails to meet a required test on the first trial, a second trial may be made at the option of the bidder within thirty (30) days of the date of the first trial.

The second trial shall be final or conclusive, and failure to comply with these requirements shall be cause for rejection and exercise of the performance bond.

Permission to keep or store apparatus, in any building owned or occupied by the purchaser, during the above specified period with the permission of the bidder, shall not constitute acceptance of the same.

ROAD REQUIREMENTS

Road tests shall be conducted by the bidder with the apparatus fully loaded, and a continuous run of ten (10) miles will be made under typical driving conditions, during which time the apparatus shall show no loss of power or overheating. The transmission, drive shafts, front and rear axles, etc. shall run quietly and be free from abnormal vibration or noise throughout the operating range of the apparatus.

REQUIRED BONDING

Each bid must be accompanied by a bid bond in the amount of ten (10%) percent of the maximum amount of the bid, to assure the purchaser of the adherence of the bidder to the bid, and the execution of the contract.

Within ten (10) days after the opening of bids, the bid bonds of all but the three (3) responsible Bidders who comply with these specifications will be returned, or if all bids are rejected, the bid bonds of all bidders will be returned. Within ten (10) days after the execution of the contract and acceptance of the bidder's bond by the purchaser, the bid bond of the successful bidder, and any remaining bidders, will be returned.

If the bidder to whom the contract is awarded refuses or neglects to execute within two (2) weeks after notice to them of the award, the amount of their deposit may be forfeited and shall be retained by the purchaser as liquidated damages.

FORM AND DOCUMENT REQUIREMENTS

The bidder shall submit a certified weight distribution diagram with their bid that includes stating the payload capacity (G.V.W. less empty weight of apparatus).

The bidder shall submit with the bid a list of similar vehicles that they have previously manufactured and delivered in New England.

A statement that guarantees replacement parts for all components manufactured by the body builder will be available for a period not less than 20 years. The statement shall be signed by an officer of the company.

A sample form of the inspection criteria used during the paint process of the apparatus shall be furnished with the bid. This form shall require information pertaining to the areas of the apparatus painted, when painted, type and quantity of priming and finish paints used, and a graded scale of the finish paint quality. The form shall require signature of the body builder's paint supervisor, with inspection date, to indicate that each particular step is acceptable and approved.

Each bid must give the full business address of the bidder. The name of each person signing the bid shall also be typed or printed below the signature.

The bidder must provide the name, full address and phone number of its authorized sales representative who is to coordinate the contract and delivery of the apparatus.

All proposals shall be valid for at least 90 days from the due date. No proposal may be withdrawn prior to 7 days from the due date. The town may request additional information after the bid opening.

The town is seeking delivery, training and 'turn-key" proposal.

PAINT TESTING

The bidder shall have conducted salt tests on at least three major paint manufacturer's products to determine which showed the most desirable results in terms of appearance and durability. A set of test plates of each product shall have been given to each individual paint manufacturer as well as a third party testing firm. The results of the tests shall be in writing and available for inspection by the purchaser.

INSURANCE

The bidder shall provide with the bid a Certificate of Insurance, listing the amount of the company's product liability insurance coverage. This insurance shall not be less than $10,000,000.00 total aggregate coverage.

The bidder shall maintain full casualty insurance coverage on the cab and chassis from the time of first possession until the title to apparatus is accepted by purchaser.

The purchaser reserves the right to require proof of insurance from the bidder's insurance carrier prior to entering into contract with the bidder.

APPARATUS DRAWINGS

The bidder shall submit, with the proposal, two (2) sets of scaled apparatus drawings done exactly to these specifications.

Said drawings shall be submitted with the bid proposal in order for the purchaser to permit evaluation of the scope of the work being proposed by the bidder and its conformance to the specifications.

At a minimum, the drawings shall show left side exterior, right side exterior, and rear exterior. When applicable, the body top view or interior floor plan shall also be shown.

A bidder may attach any explanatory materials, brochures, or other documents that they feel may be of use in the presentation.

THREE DIMENSIONAL BODY DRAWING

A three dimensional drawing of the Bidders typical extruded aluminum body shall be submitted with the bidders proposal. The drawing shall show all the aluminum extrusions used including type and shape, and where located. The areas where the body cross members are mounted to the chassis frame shall also be shown.

This three dimensional drawing must be submitted to give the Purchaser a clear understanding of the structural integrity of the unit. A thorough description of materials used in the construction of the apparatus, prepared by a professional engineer, shall also be provided with structural drawing.

EXCEPTIONS, VARIATIONS OR CLARIFICATIONS

Each Bidder is required to provide a complete and accurate description of the proposed apparatus.

To provide for a fair and readily comparable evaluation of the proposals, the Bidder must list the apparatus description in the same sequence as provided in this bid specification.

Since all components specified by brand, model number, dimension, size, or capacity are readily available to all Bidders, bidding of variations and alternates must be detailed clearly.

To provide a fair comparison of all bidder's proposals, any exceptions, variations, or clarifications to these specifications must be set forth on a separate sheet with the bidder's letterhead in the bid. These exceptions, variations, or clarifications must be numbered to correspond with items numbered in the specifications.

Specifically, all bidders are required to submit these specifications with their proposal, underlining each item where the bidder's proposal differs and consecutively number each. The number shall correspond with the bidder's exception, variation, or clarification page which shall be included with the proposal.

NOTE: Failure to list each and every exception in the above manner will result in rejection of bidder's proposal. A general statement taking "total exception" to the specifications will result in rejection of that bid.

PATENT INDEMNIFICATION BY BIDDER

The bidder, if the bid is accepted, shall indemnify the purchaser against patent infringement claims and will defend any and all suits and assume all liability for use and all claims made against the purchaser or any of its officials or agents for the use of any patents, process, device or article forming a part of the apparatus or any appliance furnished under contract.

COMPLETION

The bidder shall specify the estimated number of calendar days that the apparatus will be completed after award of the contract. The bidder will not be held liable for delay in delivery caused by events not subject to control such as accidents, strikes or floods.

PRICING, TERMS AND CONTRACTS

The bid price shall not include any local, State or Federal taxes. The bidder shall not be liable for any State or Federally mandated tax which becomes law after the signing of the contract for this apparatus. The bidder shall state if their price includes delivery to the purchaser and shall separate out the cost of such delivery for evaluation by the purchaser.

The chassis payment shall be made to the body builder upon completion of the chassis. The remainder of the contract shall be paid upon completion of the body at the body builder's facility.

Bidders shall be required to provide, in exact detail, the payment terms for said apparatus in their fire apparatus proposal.

Any contract which the purchaser shall enter into shall include the attached specifications, in addition to bidder's proposal specifications.

AWARD OF CONTRACT

The town reserves the right to reject any and all proposals, either in whole or in part; to waive any defects, informalities and/or irregularities in proposal responses; to accept substitutions or exceptions to these requirements; to negotiate with the successful bidder; and to otherwise act,

shall be determined by the Fire Chief to be in the best interest of the town.

The purchaser reserves the right to waive any informality in bids received when such waiver is in the interest of the purchaser; also to accept any item in the bid, unless otherwise specified by the purchaser or bidder.

Each bidder shall be prepared, if so requested by the purchaser, to present specific evidence of their experience, qualifications, and financial ability to carry out the terms of the contract. The financial capability of the bidder will be seriously considered as part of the bid evaluation. Any bidder wishing to submit a proposal may be required to meet with the Town Administrator and/or the Fire Chief.

Acceptance takes place when the town agrees with the contractor that the terms and conditions of the contract have been met.

Vendor may submit multiple bids. Each proposal will be evaluated separately.

The bid must include the trade in of our 1990 E-One Hurricane pumper. This vehicle may be viewed at the Durham Fire Department, 51 College Rd. Durham NH 03824 upon request to the Assistant Fire Chief Dave Emanuel. This trade will be for the cab, chassis and body only. All emergency equipment will be removed.

Prospective bidders shall have been in business for at least 10 years.

EVALUATION PROCESS

The Fire Chief will evaluate vendor's proposals against specifications as presented in this document. The Fire Chief will make the final decision. No award will be made to any vendor who cannot satisfy the Fire Chief that they have sufficient ability and experience in this class of work and sufficient capital and plan to enable them to prosecute and complete delivery of the services successfully within the time named. The Fire Chief's decision or judgment on these matters shall be final, conclusive and binding.

WITHDRAWAL OF BIDS

Bids may be withdrawn by bidders by certified mail or telegraphic request prior to the time and date fixed for opening.

Negligence on the part of the bidder in preparing the bid confers no right of the withdrawal of the bid after it has been opened.

No bidder may withdraw their bid after the time and date set or the opening thereof.

FULL DOCUMENTATION AT TIME OF DELIVERY

- The bidder must supply, at the time of delivery, complete and detailed operation and maintenance manuals for all apparatus components.

- A complete and exact wiring diagram of the delivered body electrical system will be provided at the time of delivery.

- A written procedure, on company letterhead, shall be provided with the delivered vehicle detailing correct steps to be taken for future mixing of paint for touch up and repaint purposes. This shall include exterior job color paint and compartment interior paint. A copy of this document must be provided with the bidder's proposal.

- A high quality, long lasting finish and appearance is critical with this apparatus. A document, on company letterhead, shall be provided with the delivered vehicle detailing the procedure for maintenance and cleaning of the apparatus paint, lettering, striping, and aluminum treadplate. The document shall detail steps to be taken during the "initial" cleaning process and "final" cleaning process, including type of materials and solutions to be used and the required unit measurement of each solution.

- Procedures shall also be explained for correct waxing of the vehicle. The document shall include an explanation of the danger of acid rain and the proper precautions to be taken to protect the apparatus. A copy of this maintenance, cleaning, and waxing document must be provided with the bidder's proposal.

- The delivered apparatus shall have a certified G.V.W.R. weight sticker applied to the vehicle on delivery to assure the apparatus meets all laws pertaining to the weight carrying capacity of the vehicle.

WARRANTY

The bidder shall include with his bid a copy of his warranty.

A 15 year structural warranty on the body shall be furnished with the time limit clearly stated.

A warranty document from the paint manufacturer shall be provided with the proposal stating the paint products will be of good quality and workmanship and conform to DuPont performance specifications. The duration of the warranty shall be five (5) years as explained in the warranty document.

CONFLICT TO SPECIFICATIONS

To be considered, all proposals must be made in accordance with these "Instructions to Bidders".

Should any bidder find, during examination of specifications, any discrepancies, omissions, ambiguities or conflicts, or be in doubt as to their meaning, he shall request from the purchaser, in writing, an interpretation or correction thereof not later than ten (10) days before the date of the bid opening. The purchaser will review the question, and where the information sought is not clearly indicated or specified, in their opinion, they will issue a clarifying or correcting addendum bulletin. Proper interpretation or the making of any necessary inquiry will be the bidder’s responsibility.

All specifications herein contained are considered as minimum. No exceptions to these minimum standards shall be allowed relating to gauge of metal, size of components, and overall design.

DURHAM FIRE DEPARTMENT LADDER SPECIFICATIONS

NON - COLLUSION CLAUSE:

PLEASE DETACH AND SUBMIT WITH PROPOSAL.

"The undersigned certifies under penalties of perjury that this proposal is in all respects bona fide, fair and made without collusion or fraud with any other person. As used in this section the word "person" means any natural person, joint venture, partnership, corporation or other business or legal entity. Further, I certify that the items to be supplied by my firm will meet or exceed the specifications as listed in this request for proposal."

Firm: _____

Address: _____

_____

_____

Telephone: _____

Email: _____

_____ _____

Signature: Date:

_____ _____

Name (Print): Title:

TOWN OF DURHAM BID FORM

PLEASE DETACH AND SUBMIT WITH PROPOSAL

Pumper Bid # 2017: FD-PUMPER

Chief Corey Landry
Durham Fire Department
51 College Rd
Durham, NH 03824

In accordance with the specifications, the undersigned hereby submits the following bid:

Cost to the Town $ _____

Option A $ _____

Option B $ _____

Option C $ _____

_____
Submitted for (Company Name):

Address: _____

_____

_____

Telephone: _____

Email: _____

_____ _____
Submitted by: Date:

_____ _____
Name (Print): Title:

REGULATION COMPLIANCE

Where applicable, all specifications shall fully comply with the requirements of the respective N.F.P.A. recommendations, Underwriters Laboratories Inc., State Inspection-Insurance Board, and all State and Federal Department of Transportation vehicle regulations at contract signing.

In the event the apparatus fails to meet a required UL test on the first trial, a second trial may be made at the option of manufacturer within thirty (30) days of the date of the first trial. The second trial shall be final or conclusive, and failure to comply with these requirements shall be cause for rejection and exercise of the performance bond.

Permission to keep or store apparatus, in any building owned or occupied by the purchaser, during the above specified period with the permission of the bidder, shall not constitute acceptance of the same.

ROAD REQUIREMENTS

Road tests will be conducted by the manufacturer with the apparatus fully loaded, and a continuous run of ten (10) miles will be made under typical driving conditions, during which time the apparatus will show no loss of power or overheating. The transmission, drive shafts, front and rear axles, etc. will run quietly and be free from abnormal vibration or noise throughout the operating range of the apparatus.

REQUIRED BONDING

Each must be accompanied by a bid bond in the amount of ten (10%) percent of the maximum amount of the bid, to assure the purchaser of the adherence of the bidder to the bid, and execution of the contract. Within ten (10) days after the opening of the bids, the bid bonds of all but three (3) responsible bidders who comply with these specifications will be returned, or if all bids are rejected, the bid bonds of all bidders will be returned. Within ten (10) days after the execution of the contract and acceptance of the bidder's bond by the purchaser, the bid bond of the successful bidder, and any remaining bidders, will be returned.

If the bidder to whom the contract is awarded refuses or neglects to execute within two(2) weeks after notice to him of the award, the amount of his deposit may be forfeited and shall be retained by the purchaser as liquidated damages.

FORM AND DOCUMENT REQUIREMENTS

The following items shall be included in the bid proposal:

- A certified weight distribution diagram stating the payload capacity (G.V.W. less empty weight of apparatus).

- A separate listing of a minimum of ten customers that have purchased two or more emergency vehicles similar to this proposal that the bidder has manufactured in the last ten years. The listing includes the names, addresses, and telephone numbers of the purchasers' Fire Chiefs.

- A statement that guarantees replacement parts will be available for a period of not less than 20 years on all components manufactured by the bidder. This statement is signed by an officer of the company.

- A sample form of the inspection criteria used during the paint process of the apparatus. This form provides information pertaining to the areas of the apparatus painted, when painted, type and quantity of priming and finish paints used, and a graded scale of the finish paint quality. The form is signed by the manufacturer's paint supervisor, with inspection date, to indicate that each particular step is acceptable and approved.

- A "Driveshaft Alteration Record" on any vehicle where the driveline work is done for installation of a

pump or PTO. This shows specific angles used for the pump and/or PTO and is signed and dated by the responsible individual.

- An estimated Amp draw analysis of the proposed apparatus 12 volt electrical system that shows estimated Amp draw of the apparatus responding to the scene and of the apparatus at the scene.

- Builder shall have ISO 9001 certification for quality and the assurance of readily available replacement parts into the future. Copy of certificate of audit is to be included in this proposal.

- Bidder's full business address and the name of each person signing the bid typed or printed below the signature.

- The name, full address and phone number of the manufacturers authorized sales representative who will coordinate the contract and delivery of the apparatus.

INSURANCE

The bidder shall provide with their bid a Certificate of Insurance listing the amount of the bidder's Product Liability insurance coverage. This insurance shall not be less than $10,000,000 total aggregate coverage.

The bidder shall maintain full casualty insurance coverage on the cab and chassis from the time of first possession until title to apparatus is accepted by the purchaser.

The purchaser may reserve the right to require proof of insurance from manufactures insurance carrier prior to entering into contract.

APPARATUS DRAWINGS

Bidder will included with the proposal, two (2) sets of scaled apparatus drawings done exactly to these specifications.

Said drawings are submitted in order for the Purchaser to permit evaluation of the scope of the work being proposed by the manufacturer and our conformance to the specifications.

At a minimum, the drawings show left side exterior, right side exterior, and rear exterior. When applicable, the body top view or interior floor plan is also shown.

THREE-DIMENSIONAL PLUMBING DRAWING

A three-dimensional drawing of manufacturers proposed pump compartment is submitted with the proposal. The drawing includes the pump panels, components, valves, and control rod placement for department review and acceptance of the engineered layout of the unit.

WIRING DIAGRAM

The bidder shall submit a wiring diagram that is typical for the type of unit being proposed by the manufacturer, so that the purchaser can review the overall electrical system.

EXCEPTIONS, VARIATIONS OR CLARIFICATIONS

Each bidder is required to provide a complete and accurate description of the proposed apparatus.

To provide for a fair and readily comparable evaluation of the proposals, the manufacturer should list the apparatus description in the same sequence as provided in the purchaser's bid specification.

Any variations and alternates of the brand, model number, dimension, size, or capacity are to be detailed

clearly in the Clarifications and/or Exception page.

The Clarifications and/or Exception page is a separate sheet on the manufacturer's letterhead and is numbered to correspond with items numbered in the purchaser's specifications.

NOTE: Failure to list each and every exception in the above manner may result in rejection of the bidder's proposal. A general statement taking "total exception" to the specifications will result in rejection of that bid.

PATENT INDEMNIFICATION BY BIDDER

The bidder, if their bid is accepted, shall indemnify the purchaser against patent infringement claims and will defend any and all suits and assume all liability for the use and all claims made against the purchaser or any of its officials or agents for the use of any patents, process, device or article forming a part of the apparatus or any appliance furnished under contract.

COMPLETION

The bidder will specify the estimated number of calendar days that the apparatus will be completed after award of the contract. The manufacturer will not be held liable for delay in delivery caused by events not subject to control such as accidents, strikes or floods.

PRICING, TERMS AND CONTRACTS

The bid price shall not include any Local, State of Federal taxes. The bidder shall not be liable for any State or Federal mandated tax which becomes law after the signing of the contract for this apparatus. The bidder shall state if their price includes delivery to the purchaser and shall separate out the cost of such delivery for evaluation by the purchaser.

Bidders shall be required to provide, in exact detail, the payment terms for said apparatus in their fire apparatus proposal.

Any contract which the purchaser shall enter into shall include the attached specifications, in addition to the bidder's proposal specifications.

AWARD OF CONTRACT

The contract will be awarded as soon as possible to the lowest reasonable bidder, provided the bid is responsive to the specification, reasonable, and in the sole judgement of the purchaser is in the best interest of the purchaser to accept it.

The purchaser reserves the right to waive any informality in the bids received when such waiver is in the interest of the purchaser; also to accept any item in the bid, unless otherwise specified by the purchaser or bidder.

Each bidder shall be prepared, if so requested by the purchaser, to provide specific evidence of his experience, qualification, and financial ability to carry out he terms of the contract. The financial capability of the bidder will be seriously considered as part of the bid evaluation.

REJECTION OF BIDS

The competency and responsibility of bidders will be considered in making the award. The purchaser reserves the right to reject any and all bids when, in their sole judgement, such rejection is in the best interest of the purchaser, and to reject the bid of a bidder who, in the judgement of the purchaser, is not in a positon to fulfill the contract. The purchaser does not obligate itself to accept the lowest or any bid.

WITHDRAWAL OF BIDS

Bids may be withdrawn by bidders by certified mail or telegraphic request prior to the time and date fixed for opening.

Negligence on the part of the bidder in preparing the bid confers no right of the withdrawal of the bid after it has been opened.

No bidder may withdraw their bid after the time and date set or the opening thereof.

WARRANTY

Manufacturer will warrant the apparatus to be free from defects in material and workmanship for a period of one (1) year. Component parts, if found to be defective, will be repaired or replaced without cost to purchaser. This warranty will be exclusive of the chassis, fire pump, and other trade accessories, which is normally warranted by their respective manufacturers.

In addition to the one (1) year base warranty, the following extended warranties shall be furnished if applicable:

- A fifteen (15) year structural warranty.
- A ten (10) year paint warranty.
- A five (5) year electrical warranty.
- A five (5) year stainless steel plumbing warranty.
- A Lifetime warranty on the frame and cross members.

The manufacturer shall include a copy of this warranty with the bid.

CONFLICT TO SPECIFICATIONS

To be considered, all proposals must be made in accordance with these “Instructions to Bidders”

Should any bidder find, during examination of specifications, any discrepancies, omissions, ambiguities or conflicts, or be in doubt as to their meaning, he shall request from the purchaser, in writing, an interpretation or correction thereof not later than ten days before the date of the bid opening. The purchaser will review the question, and where the information sought is not clearly indicated or specified, in their opinion, they will issue a clarifying or correcting addendum bulletin. Proper interpretation or the making of any necessary inquiry will be the bidder’s responsibility.

All specifications herein contained are considered as minimum. No exceptions to these minimum standards shall be allowed relating to gauge of metal, size of components, and overall design.

INSPECTION

While unit is under construction, personnel from the fire department shall be able to inspect work in process at the manufacturer’s facility to insure conformance to these construction standards. Inspection costs, transportation, lodging, etc., shall be the responsibility of the bidder approved by the purchaser and allow for (3) three personnel to inspect at (2) two different intervals of the purchasers choice.

FINAL CONSTRUCTION INSPECTION TRIP

A final construction inspection trip for three (3) department member’s to the factory will be supplied to verify the apparatus has been constructed as required by the contract.

FULL DOCUMENTATION AT TIME OF DELIVERY

The manufacturer shall supply the purchaser at time of delivery the following documentation:

- Complete and detailed operation and maintenance manuals for all apparatus components.
- A complete and exact wiring diagram of the delivered body electrical system.
- A written procedure, on the manufacturer's letterhead, detailing correct steps to be taken for future mixing of paint for touch up and repaint purposes. This will include exterior job color paint and compartment interior paint.
- A document, on letterhead, detailing the procedure for maintenance and cleaning of the apparatus paint, lettering, striping, and aluminum tread plate. The document will detail steps to be taken during the "initial" cleaning process and "final" cleaning process, including type of materials and solutions to be used and required unit measurement of each solution.
- Procedures for correct waxing of the vehicle. The document will include an explanation of the danger of acid rain and the proper precautions to be taken to protect the apparatus. A copy of this maintenance, cleaning, and waxing document is provided with this proposal.
- The delivered apparatus will have a certified G.V.W.R. weight sticker applied to the vehicle on delivery to assure the apparatus meets all laws pertaining to the weight carrying capacity of the vehicle.

THREE DAY TRAINING

Upon delivery of the completed apparatus, a minimum of one authorized and trained individual from the company will conduct a three-day training session for the purchaser's personnel.

Training will include all aspects of apparatus operation.

The training schedule will be mutually agreed upon by the purchaser and manufacturer's representative.

PRE-CONSTRUCTION MEETING

A pre-construction meeting shall be held utilizing "GoToMeeting" conferencing prior to any construction processes at the bidder's manufacturing facility. Authorized representatives of both the purchaser and the manufacturer shall be present (a dealer of the manufacturer is not acceptable). The "GoToMeeting" shall be a secure online meeting with transmit and receive audio capabilities for participants.

Prior to and during the meeting the manufacturer shall supply complete apparatus drawings and specifications for review and purchaser approval.

APPROVAL DRAWINGS

Two (2) sets of engineering blueprints, CAD drawn to scale specifically for this apparatus, shall be provided. The Fire Department shall review and approve these drawings prior to actual construction of the apparatus.

Both left and right side views, a rear view and a top view shall be provided. The blueprints shall also show the overall dimensions of the apparatus, proposed compartment sizes and features, booster tank position, and the location of all emergency warning and work lights that are to be provided by the body builder.

THIRD PARTY TESTING

The complete apparatus shall be third party tested and certified as a class "A" triple combination pumper. Unit shall also meet or exceed all N.F.P.A. Pamphlet No. 1901 (latest edition) specifications and

standards.

PERFORMANCE REQUIREMENTS

The apparatus, when fully equipped and loaded, shall be capable of the following performance on dry, level, paved roads in good condition:

- From a standing start the vehicle shall attain a true speed of 35 mph within 25 seconds.
- From a steady speed of 15 mph the vehicle shall accelerate to a true speed of 35 mph within 30 seconds. This shall be accomplished without moving the gear selector.
- The vehicle shall attain a minimum top speed of not less than 50 mph.
- The apparatus shall be able to maintain a speed of at least 20 mph on any grade up to and including six percent

	Yes	No

MODEL

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

The chassis shall have a vehicle identification number that reflects a 2017 model year.

COUNTRY OF SERVICE

The chassis shall be put in service in the country of United States of America (USA).

The chassis will meet applicable U.S.A. federal motor vehicle safety standards per CFR Title 49 Chapter V Part 571 as clarified in the incomplete vehicle book per CFR Title 49 Chapter V Part 568 Section 4 which accompanies each chassis. The chassis manufacturer is not responsible for compliance to state, regional, or local regulations. Dealers should identify those regulations and order any necessary optional equipment from the chassis manufacturer or their OEM as needed to be in compliance with those regulations.

CAB AND CHASSIS LABELING LANGUAGE

The cab and chassis shall include the applicable caution, warning, and safety notice labels with text to be written in English.

APPARATUS TYPE

The apparatus shall be a pumper vehicle designed for emergency service use which shall be equipped with a permanently mounted fire pump which has a minimum rated capacity of 750 gallons per minute (3000 L/min). The apparatus shall include a water tank and hose body whose primary purpose is to combat structural and associated fires.

VEHICLE TYPE

The chassis shall be manufactured for use as a straight truck type vehicle and designed for the installation of a permanently mounted apparatus behind the cab. The apparatus of the vehicle shall be supplied and installed by the apparatus manufacturer.

AXLE CONFIGURATION

The chassis shall feature a 4 x 2 axle configuration consisting of a single rear drive axle with a single front steer axle.

GROSS AXLE WEIGHT RATINGS FRONT

The front gross axle weight rating (GAWR) of the chassis shall be 20,000 pounds.

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

GROSS AXLE WEIGHT RATINGS REAR

The rear gross axle weight rating (GAWR) of the chassis shall be 27,000 pounds.

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

	Yes	No

PUMP PROVISION

The chassis shall include provisions to mount a drive line pump in the middle of the chassis, behind the cab, more commonly known as the midship location.

WATER & FOAM TANK CAPACITY

The chassis shall include a carrying capacity of 750 gallons (2839 liters), and a 40 gallons (151 liters) foam tank. The water and/or foam tank(s) shall be supplied and installed by the apparatus manufacturer.

CAB STYLE

The cab shall be a custom, fully enclosed model with a 10.00 inch raised roof over the driver, officer, and crew area, designed and built specifically for use as an emergency response vehicle by a company specializing in cab and chassis design for all emergency response applications. The cab shall be designed for heavy-duty service utilizing superior strength and capacity for the application of protecting the occupants of the vehicle. This style of cab shall offer up to ten (10) seating positions.

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

The cab shall be constructed using multiple aluminum extrusions in conjunction with aluminum plate, which shall provide proven strength and the truest, flattest body surfaces ensuring less expensive paint repairs if needed. All aluminum welding shall be completed to the American Welding Society and ANSI D1.2-96 requirements for structural welding of aluminum.

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

The cab shall be constructed of 5052-H32 corrosion resistant aluminum plate. The cab shall incorporate tongue and groove fitted 6061-T6 0.13 & 0.19-inch-thick aluminum extrusions for extreme duty situations. A single formed, one (1) piece extrusion shall be used for the “A” pillar, adding strength and rigidity to the cab as well as additional roll-over protection. The cab side walls and lower roof skin shall be 0.13-inch-thick; the rear wall and raised roof skins shall be 0.09-inch-thick; the front cab structure shall be 0.19 inch thick.

The exterior width of the cab shall be 94.00 inches wide with a minimum interior width of 88.00 inches. The overall cab length shall be 144.60 inches with 67.50 inches from the centerline of the front of the axle to the back of the cab.

The cab interior shall be designed to afford the maximum usable interior space and attention to ergonomics with hip and legroom while seated which exceeds industry standards. The crew cab floor shall be flat across the entire walking area for ease of movement inside the cab.

The cab shall offer an interior height of 57.50 inches from the front floor to the headliner and a rear floor to headliner height of 65.00 inches in the raised roof area, at a minimum. The cab shall offer an interior measurement at the floor level from the rear of the engine tunnel to the rear wall of the cab of 65.38 inches. All interior measurements shall include the area within the interior trimmed surfaces and not to any unfinished surface.

The cab shall include a driver and officer area with two (2) cab doors large enough for personnel in full firefighting gear. The front doors shall offer a clear opening of 40.25 inches wide X 53.50 inches high, from the cab floor to the top of the door opening. The cab shall also include a crew area with up to two (2) cab doors, also large enough for personnel in full firefighting gear. The rear doors shall

Yes	No

offer a clear opening of 32.25 inches wide X 61.00 inches high, from the cab floor to the top of the door opening.

The cab shall incorporate a progressive two (2) step configuration from the ground to the cab floor at each door opening. The progressive steps are vertically staggered and extend the full width of each step well allowing personnel in full firefighting gear to enter and exit the cab easily and safely.

The first step for the driver and officer area shall measure approximately 11.50 inches deep X 31.13 inches wide. The intermediate step shall measure approximately 8.50 inches deep X 32.50 inches wide. The height from the first step to the intermediate step and the intermediate step to the cab floor shall not exceed 11.00 inches.

The first step for the crew area shall measure approximately 11.50 inches deep X 20.44 inches wide. The intermediate step shall measure approximately 10.25 inches deep X 22.75 inches wide. The height from the first step to the intermediate step and the intermediate step to the cab floor shall not exceed 12.80 inches.

OCCUPANT PROTECTION

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

The system components shall include:

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

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

The APS frontal impact system shall be independently tested to ensure occupant injury criteria does not exceed injury criteria defined in Federal Motor Vehicle Safety Standard (FMVSS) 208. Frontal impact into a rigid barrier at 25 mph shall be conducted by an independent third party test facility using belted 95th percentile Hybrid II test dummies.

	Yes	No

Rollover, side impact, and ejection mitigation shall be provided by the outboard sensors and the RCM. In qualifying rollover or side impact events the outboard sensors provide inputs to the RCM. The RCM activates the side curtain airbags and advanced seat belts for each occupant in the cab. The RCM measures roll angle, lateral acceleration, and roll rate to determine if a rollover event or side impact event is imminent or occurring.

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

The APS side impact system shall be independently tested to ensure occupant injury criteria does not exceed injury criteria defined in Federal Motor Vehicle Safety Standard (FMVSS) 214. Side impact from a moving barrier at 17 mph shall be conducted by an independent third party test facility using belted 50th percentile ES-2re test dummies.

CAB FRONT FASCIA

The front cab fascia shall be constructed of 5052-H32 Marine Grade, 0.13 of an inch-thick aluminum plate which shall be an integral part of the cab.

The cab fascia will encompass the entire front of the aluminum cab structure from the bottom of the windshield to the bottom of the cab and shall be the “Classic” design.

The front cab fascia shall include two (2) molded plastic modules on each side accommodating a total of up to four (4) Hi/Low beam headlights and two (2) turn signal lights or up to four (4) warning lights. A chrome plated molded plastic bezel shall be provided on each side around each set of four lamps.

FRONT GRILLE

The front fascia shall include a box style, 304 stainless steel front grille 44.45 inches wide X 33.50 inches high X 1.50 inches deep. The grille shall include a minimum free air intake of 732.00 square inches.

CAB UNDERCOAT

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

CAB SIDE DRIP RAIL

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

CAB PAINT EXTERIOR

The cab shall be painted prior to the installation of glass accessories and all other cab trim to ensure complete paint coverage and the maximum in corrosion protection of all metal surfaces.

All metal surfaces on the entire cab shall be ground by disc to remove any surface oxidation or surface debris which may hinder the paint adhesion. Once the surface is machine ground a high-quality acid etching of base primer shall be applied. Upon the application of body fillers and their preparation, the cab shall be primed with a coating designed for corrosion resistance and surface paint adhesion. The maximum thickness of the primer coat shall be 2.00 mils.

The entire cab shall then be coated with an intermediate solid or epoxy surfacing agent that is designed to fill any minor surface defects, provide an adhesive bond between the primer and the paint and improve the color and gloss retention of the color. The finish to this procedure shall be a sanding

	Yes	No

of the cab with 360 grit paper followed by sealing the seams with SEM brand seam sealer.

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

CAB PAINT MANUFACTURER

The cab shall be painted with PPG Industries paint.

CAB PAINT PRIMARY/LOWER COLOR

The lower paint color shall be PPG product. The primary/lower paint color shall be: PPG FBCH 4217 Vermillion Red

CAB PAINT SECONDARY/UPPER COLOR

The secondary/upper paint color shall be PPG FBCH 4289 White.

CAB PAINT EXTERIOR BREAKLINE

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

CAB PAINT PINSTRIPE

No pinstripe shall be provided over the cab paint break line by the chassis manufacturer. The paint break line shall be of a finish grade quality that shall not require that any pinstripe be installed over the paint break line.

CAB PAINT WARRANTY

The cab and chassis shall be covered by a limited manufacturer paint warranty which shall be in effect for ten (10) years from the first owner's date of purchase or in service or the first 100,000 actual miles, whichever occurs first.

CAB PAINT INTERIOR

The visible interior cab structure surfaces shall be painted with a multi-tone silver gray texture finish.

CAB ENTRY DOORS

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

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

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

	Yes	No

All cab doors will have power windows and manual locks.

CAB ENTRY DOOR TYPE

All cab entry doors shall be full length in design to fully enclose the lower cab steps. Entry doors shall include Pollak mechanical plunger style switches for electrical component activation.

CAB INSULATION

The cab ceiling and walls shall include 1.00-inch-thick foam insulation. The insulation shall act as a barrier absorbing noise as well as assisting in sustaining the desired climate within the cab interior.

LH EXTERIOR REAR COMPARTMENT

The cab shall offer an exterior compartment on the left side of the cab behind the rear door. The compartment opening shall be 10.00 inches wide X 21.19 inches high. The compartment size shall be 11.34 inches wide X 21.19 inches high X 21.19 inches deep. The compartment shall have a 10.63-inch-wide, 32.00 inch high and 1.50 inch thick hinged box pan style flush mount door with a bright aluminum tread plate inner panel and a bent D-ring slam latch. There shall be a switch to activate a light inside the compartment and the open compartment warning light in the cab in the event the door is left ajar.

LEFT HAND EXTERIOR REAR COMPARTMENT LIGHTING

There shall be one (1) SoundOff Signal brand LED strip light installed to illuminate the exterior rear compartment on the left side of the cab. The strip light shall be 10.00 inches long and shall include three (3) bright white Gen3 LEDs.

LH EXTERIOR COMPARTMENT INTERIOR FINISH

The interior of the left hand exterior compartment shall have a DA sanded finish.

RH EXTERIOR REAR COMPARTMENT

The cab shall offer an exterior compartment on the right side of the cab behind the rear door. The compartment opening shall be 10.00 inches wide X 21.19 inches high. The compartment size shall be 11.34 inches wide X 21.19 inches high X 21.19 inches deep. The compartment shall have a 10.63-inch-wide, 32.00 inch high and 1.50 inch thick hinged box pan style flush mount door with a bright aluminum tread plate inner panel and a bent D-ring slam latch. There shall be a switch to activate a light inside the compartment and the open compartment warning light in the cab in the event the door is left ajar.

RIGHT HAND EXTERIOR REAR COMPARTMENT LIGHTING

There shall be one (1) SoundOff Signal brand LED strip light installed to illuminate the exterior rear compartment on the right side of the cab. The strip light shall be 10.00 inches long and shall include three (3) bright white Gen3 LEDs.

RH EXTERIOR COMPARTMENT INTERIOR FINISH

The interior of the right hand exterior compartment shall have a DA sanded finish.

CAB STRUCTURAL WARRANTY

Summary of Warranty Terms:

The cab structure shall be warranted for a period of ten (10) years or one hundred thousand (100,000) miles which ever may occur first. The warranty period shall commence on the date the vehicle is

	Yes	No

delivered to the first end user.

CAB TEST INFORMATION

The cab shall have successfully completed the preload side impact, static roof load application and frontal impact without encroachment to the occupant survival space when tested in accordance with Section 4 of SAE J2420 COE Frontal Strength Evaluation Dynamic Loading Heavy Trucks, Section 5 of SAE J2422 Cab Roof Strength Evaluation Quasi –Static Loading Heavy Trucks and ECE R29 Uniform Provisions Concerning the Approval of Vehicles with regard to the Protection of the Occupants of the Cab of a Commercial Vehicles Annex 3 Paragraph 5.

The above tests have been witnessed by and attested to by an independent third party. The test results were recorded using cameras, high speed imagers, accelerometers and strain gauges. Documentation of the testing shall be provided upon request.

ELECTRICAL SYSTEM

The chassis shall include a single starting electrical system which shall include a 12-volt direct current system, suppressed per SAE J551. The wiring shall be appropriate gauge cross link with 311-degree Fahrenheit insulation. All SAE wires in the chassis shall be color coded and shall include the circuit number and function where possible. The wiring shall be protected by 275-degree Fahrenheit minimum high temperature flame retardant loom.

DATA RECORDING SYSTEM

The chassis shall have a Weldon Vehicle Data Recorder (VDR) system installed. The system shall be designed to meet NFPA 1901. The following information shall be recorded:

- Vehicle Speed
- Acceleration
- Deceleration
- Engine Speed
- Engine Throttle Position
- ABS Event
- Seat Occupied Status
- Seat Belt Status
- Master Optical Warning Device Switch Position
- Service Brake
- Engine Hours
- Time
- Date

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

ACCESSORY POWER

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

EXTERIOR ELECTRICAL TERMINAL COATING

Yes	No

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

ENGINE

The chassis engine shall be a Cummins L9 engine. The L9 engine shall be an in-line six (6) cylinder, four cycle diesel powered engine. The engine shall offer a rating of 450 horse power at 2100 RPM and shall be governed at 2200 RPM. The torque rating shall feature 1250 foot pounds of torque at 1400 RPM with 543 cubic inches (8.9 liters) of displacement.

The L9 engine shall feature a VGT™ Turbocharger, a high pressure common rail fuel system, fully integrated electronic controls with an electronic governor, and shall be EPA certified to meet the 2017 emissions standards using cooled exhaust gas recirculation and selective catalytic reduction technology.

The engine shall include an engine mounted combination full flow/by-pass oil filter with replaceable spin on cartridge for use with the engine lubrication system. The engine shall include Citgo brand Citgard 500, or equivalent SAE 15W40 CJ4 low ash engine oil which shall be utilized for proper engine lubrication.

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

CAB ENGINE TUNNEL

The cab interior shall include an integrated engine tunnel constructed of 5052-H32 Marine Grade, 0.19 of an inch-thick aluminum. The tunnel shall be a maximum of 41.50 inches wide X 25.50 inches high.

DIESEL PARTICULATE FILTER CONTROLS

There shall be two (2) controls for the diesel particulate filter. One (1) control shall be for regeneration and one (1) control shall be for regeneration inhibit.

ENGINE PROGRAMMING HIGH IDLE SPEED

The engine high idle control shall maintain the engine idle at approximately 1250 RPM when engaged.

ENGINE HIGH IDLE CONTROL

The vehicle shall be equipped with a high-idle speed control rocker switch, which shall be pre-set to maintain the engine idle at a pre-determined rate when activated manually. This device shall operate when the master switch is activated and safely interlocked only to function when the transmission is in neutral with the parking brake set.

ENGINE PROGRAMMING ROAD SPEED GOVERNOR

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

AUXILIARY ENGINE BRAKE

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

Yes	No

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

AUXILIARY ENGINE BRAKE CONTROL

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

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

The compression brake shall be controlled through an on/off switch and a low/medium/high selector switch.

ELECTRONIC ENGINE OIL LEVEL INDICATOR

The engine oil shall be monitored electronically and shall send a signal to activate a warning in the instrument panel when levels fall below normal. The warning shall activate in a low oil situation upon turning on the master battery and ignition switches without the engine running.

FLUID FILLS

The engine oil, coolant, transmission, and power steering fluid fills shall be located under the cab. The windshield washer fill shall be accessible through the front left side mid step.

ENGINE DRAIN PLUG

The engine shall include an original equipment manufacturer installed oil drain plug.

ENGINE WARRANTY

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

REMOTE THROTTLE HARNESS

An apparatus interface wiring harness for the engine shall be supplied with the chassis. The midship harness shall include a connector for connection to the chassis harness which shall terminate in the left frame rail behind the cab for reconnection by the apparatus builder. The midship harness shall contain connectors for a Class 1 Total Pressure Governor and a multiplexed gauge. Separate circuits shall be included for pump controls, “Pump Engaged” and “OK to Pump” indicator lights, open compartment ground, start signal, park brake ground, ignition signal, master power, customer ignition, air horn solenoid switch, high idle switch and high idle indication light. The harness shall contain interlocks that will prevent shifting to road or pump mode unless the transmission output speed translates to less than 1 mph and the transmission is in neutral. The shift to pump mode shall also require the park brake be set. The harness shall be designed for a side mount pump panel.

An apparatus interface wiring harness shall also be included which shall be wired to the cab harness interface connectors and shall incorporate circuits with relays to control pump functions. This harness shall control the inputs for the transmission lock up circuits, governor/hand throttle controls and dash display which shall incorporate “Pump Engaged” and “OK to Pump” indicator lights. The harness shall contain circuits for the apparatus builder to wire in a pump switch.

Yes	No

ENGINE PROGRAMMING REMOTE THROTTLE

The engine ECM (Electronic Control Module) discreet wire remote throttle circuit shall be turned off for use with a J1939 based pump controller or when the discreet wire remote throttle controls are not required.

ENGINE PROGRAMMING IDLE SPEED

The engine low idle speed will be programmed at 700 rpm.

ENGINE FAN DRIVE

The engine cooling system fan shall incorporate a thermostatically controlled, Horton clutched type fan drive.

When the clutched fan is disengaged, it shall facilitate improved vehicle performance, cab heating in cold climates, and fuel economy. The fan clutch design shall be fail safe so that if the clutch drive fails the fan shall engage to prevent engine overheating due to the fan clutch failure.

FA shall engage when unit is placed in pump mode.

ENGINE COOLING SYSTEM

There shall be a heavy-duty aluminum cooling system designed to meet the demands of the emergency response industry. The cooling system shall have the capacity to keep the engine properly cooled under all conditions of road and pumping operations. The cooling system shall be designed and tested to meet or exceed the requirements specified by the engine and transmission manufacturer and all EPA requirements. The complete cooling system shall be mounted to isolate the entire system from vibration or stress. The individual cores of the cooling system shall be mounted in a manner to allow expansion and contraction at various rates without inducing stress into the adjoining cores.

The cooling system shall utilize a charge air cooler to radiator serial flow package that provides the maximum cooling capacity for the specified engine as well as serviceability. The main components shall include a surge tank, an air to air charge air cooler bolted to the front of the radiator, recirculation shields, a shroud, a fan, and required tubing.

The radiator shall be a down-flow design constructed with aluminum cores, plastic end tanks, and a steel frame. The radiator shall be equipped with a drain cock to drain the coolant for serviceability.

The cooling system shall include a one-piece injection molded polymer eleven (11) blade fan with a fiberglass fan shroud.

The cooling system shall be equipped with a surge tank that is capable of removing entrained air from the system. The surge tank shall be equipped with a low coolant probe and sight glass to monitor the level of the coolant. The surge tank shall have a dual seal cap that meets the engine manufacturer's pressure requirements, and allows for expansion and recovery of coolant into a separate integral expansion chamber.

All radiator tubes shall be formed from aluminized steel tubing. Recirculation shields shall be installed where required to prevent heated air from reentering the cooling package and affecting performance.

The charge air cooler shall be a cross-flow design constructed completely of aluminum with cast tanks. All charge air cooler tubes shall be formed from aluminized steel tubing and installed with silicone hump hoses and stainless steel “constant torque” style clamps meeting the engine manufacturer’s requirements.

The radiator and charge air cooler shall be removable through the bottom of the chassis.

	Yes	No

ENGINE COOLING SYSTEM PROTECTION

The engine cooling system shall include a recirculation shield designed to act as a light duty skid plate below the radiator to provide additional protection for the engine cooling system from light impacts, stones, and road debris. The skid plate shall be painted to match the frame color.

ENGINE COOLANT

The cooling package shall include Extended Life Coolant (ELC). The use of ELC provides longer intervals between coolant changes over standard coolants providing improved performance. The coolant shall contain a 50/50 mix of ethylene glycol and de-ionized water to keep the coolant from freezing to a temperature of -34 degrees Fahrenheit.

Proposals offering supplemental coolant additives (SCA) shall not be considered, as this is part of the extended life coolant makeup.

ELECTRONIC COOLANT LEVEL INDICATOR

The instrument panel shall feature a low engine coolant indicator light which shall be located in the center of the instrument panel. An audible tone alarm shall also be provided to warn of a low coolant incident.

ENGINE PUMP HEAT EXCHANGER

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

COOLANT HOSES

The cooling system hoses shall be silicone heater hose with rubber hoses in the cab interior. The radiator hoses shall be formed silicone coolant hoses with formed aluminized steel tubing. All heater hose, silicone coolant hose, and tubing shall be secured with stainless steel constant torque band clamps.

ENGINE EXHAUST SYSTEM

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

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

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

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

DIESEL EXHAUST FLUID TANK

The exhaust system shall include a molded cross linked polyethylene tank for Diesel Exhaust Fluid

	Yes	No

(DEF). The tank shall have a capacity of six (6) usable gallons and shall be mounted on the left-hand side of the chassis frame behind the batteries below the frame.

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

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

ENGINE EXHAUST ACCESSORIES

The exhaust system shall be modified to accept a Plymovent exhaust extraction system collar.

ENGINE EXHAUST WRAP

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

TRANSMISSION

The drive train shall include an Allison model EVS 3000 torque converting, automatic transmission which shall include electronic controls. The transmission shall feature two (2) 10-bolt PTO pads located on the converter housing.

The transmission shall include two (2) internal oil filters and Castrol TranSynd™ synthetic TES 295 transmission fluid which shall be utilized in the lubrication of the EVS transmission. An electronic oil level sensor shall be included with the readout located in the shift selector.

The transmission gear ratios shall be:

1st	3.49:1
2nd	1.86:1
3rd	1.41:1
4th	1.00:1
5th	0.75:1
6th	0.65:1 (if applicable)
Rev	5.03:1

TRANSMISSION MODE PROGRAMMING

The transmission, upon start-up, will automatically select a four (4) speed operation. The fifth speed over drive shall be available with the activation of the mode button on the shifting pad.

TRANSMISSION FEATURE PROGRAMMING

The Allison Gen V-E transmission EVS group package number 127 shall contain the 198 vocational package in consideration of the duty of this apparatus as a pumper. This package shall incorporate an automatic neutral with selector override. This feature commands the transmission to neutral when the park brake is applied, regardless of drive range requested on the shift selector. This requires re-selecting drive range to shift out of neutral for the override.

This package shall be coupled with the use of a split shaft PTO and incorporate pumping circuits. These circuits shall be used allowing the vehicle to operate in the fourth range lockup while operating the pump mode due to the 1 to 1 ratio through the transmission, therefore the output speed of the engine is the input speed to the pump. The pump output can be easily calculated by using this input speed and the drive ratio of the pump itself to rate the gallons of water the pump can provide.

Yes	No

A transmission interface connector shall be provided in the cab. This package shall contain the following input/output circuits to the transmission control module. The Gen V-E transmission shall include prognostic diagnostic capabilities. These capabilities shall include the monitoring of the fluid life, filter change indication, and transmission clutch maintenance.

Function ID	Description	Wire assignment
Inputs		
C	PTO Request	142
J	Fire Truck Pump Mode (4th Lockup)	122 / 123
Outputs		
C	Range Indicator	145 (4th)
G	PTO Enable Output	130
	Signal Return	103

ELECTRONIC TRANSMISSION OIL LEVEL INDICATOR

The transmission fluid shall be monitored electronically and shall send a signal to activate a warning in the instrument panel when levels fall below normal.

TRANSMISSION SHIFT SELECTOR

An Allison pressure sensitive range selector touch pad shall be provided and located to the right of the driver within clear view and easy reach. The shift selector shall have a graphical Vacuum Florescent Display (VFD) capable of displaying two lines of text. The shift selector shall provide mode indication and a prognostic indicator (wrench symbol) on the digital display. The prognostics monitor various operating parameters and shall alert you when a specific maintenance function is required.

TRANSMISSION PRE-SELECT WITH AUXILIARY BRAKE

When the auxiliary brake is engaged, the transmission shall automatically shift to second gear to decrease the rate of speed assisting the secondary braking system and slowing the vehicle.

TRANSMISSION COOLING SYSTEM

The transmission shall include a water to oil cooler system located in the cooling loop between the radiator and the engine. The transmission cooling system shall meet all transmission manufacturer requirements. The transmission cooling system shall feature continuous flow of engine bypass water to maintain uninterrupted transmission cooling.

TRANSMISSION DRAIN PLUG

The transmission shall include an original equipment manufacturer installed magnetic transmission fluid drain plug.

TRANSMISSION WARRANTY

The Allison EVS series transmission shall be warranted for a period of five (5) years with unlimited mileage. Parts and labor shall be included in the warranty.

PTO LOCATION

The transmission shall have two (2) power take off (PTO) mounting locations, one (1) in the 8:00 o'clock position and one (1) in the 4:00 o'clock position.

DRIVELINE

All drivelines shall be heavy duty metal tube and equipped with Spicer 1710 series universal joints.

	Yes	No

The shafts shall be dynamically balanced prior to installation to alleviate future vibration. In areas of the driveline where a slip shaft is required, the splined slip joint shall be coated with Glide Coat®.

MIDSHIP PUMP / GEARBOX

A temporary jackshaft driveline shall be installed by the chassis manufacturer to accommodate the mid-ship split shaft pump as specified by the apparatus manufacturer. Specific pump mounting holes shall be supplied for mounting the pump as specified by the OEM.

See PDF for specific hole pattern.

MIDSHIP PUMP / GEARBOX MODEL

The midship pump/gearbox provisions shall be for a Hale QMAX pump.

MIDSHIP PUMP GEARBOX DROP

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

MIDSHIP PUMP RATIO

The ratio for the midship pump shall be 2.28:1 (23).

MIDSHIP PUMP LOCATION C/L SUCTION TO C/L REAR AXLE

The midship pump shall be located so the dimension from the centerline of the suction to the centerline of the rear axle is 100.50 inches.

PUMP SHIFT CONTROLS

One (1) air pump shift control panel shall be located on the left-hand side of the engine tunnel, integrated with the shifter pod. The following shall be provided on the panel: a three (3) position control lever; an engraved PUMP ENGAGED identification light; and an engraved OK TO PUMP identification light. The pump shift control panel shall be black with a yellow border outline and shall include pump instructions. An instruction plate describing the transmission shift selector position used for pumping shall be provided and located so it can be read from the driver’s position per NFPA **16.10.1.3**. The road mode shall be selected when the control lever is in the forward position and pump mode shall be selected when the control lever is in the rearward position.
To match currant engine configuration.

The control lever center position shall exhaust air from both pump and road sides of the pump gear box shift cylinder.

PUMP SHIFT CONTROL PLUMBING

Air connections shall be provided from the air supply tank to the pump shift control valve and from the pump shift control valve to the frame mounted bracket. The frame mounted bracket shall include labeling identifying the pump and road connection points with threaded 0.25 inch NPT fittings on the solenoid for attaching the customer installed pump. The air supply shall be pressure protected from service brake system.

All airline fitting shall be a compression style fitting. No quick or push to connect style fittings.

FUEL LINES

The fuel system supply and return lines installed from the fuel tank to the engine shall be reinforced

	Yes	No

nylon tubing rated for diesel fuel. The fuel lines shall be brown in color and connected with brass fittings.

ELECTRIC FUEL PRIMER

Integral to the engine assembly is an electric lift pump that serves the purpose of pre-filter fuel priming.

FUEL FILTER / WATER SEPERATOR

The fuel system shall have a Fleetguard FS1003 fuel filter/water separator as a primary filter. The fuel filter shall have a drain.

A water in fuel sensor shall be provided and wired to an instrument panel lamp and audible alarm to indicate when water is present in the fuel/water separator.

FUEL TANK

The fuel tank shall have a capacity of fifty (50) gallons and shall measure 35.00 inches in width X 15.00 inches in height X 24.00 inches in length.

The baffled tank shall have a vent port to facilitate venting to the top of the fill neck for rapid filling without "blow-back" and a roll over ball check vent for temperature related fuel expansion and draw.

The tank is designed with dual draw tubes and sender flanges. The tank shall have 2.00 inch NPT fill ports for right or left hand fill. A 0.50 inch NPT drain plug shall be centered in the bottom of the tank.

The fuel tank shall be mounted below the frame, behind the rear axle. Two (2) three-piece strap hanger assemblies with “U” straps bolted midway on the fuel tank front and rear shall be utilized to allow the tank to be easily lowered and removed for service purposes. Rubber isolating pads shall be provided between the tank and the upper tank mounting brackets. Strap mounting studs through the rail, hidden behind the body shall not be acceptable.

FUEL TANK MATERIAL AND FINISH

The fuel tank shall be constructed of 12-gauge stainless steel. The exterior of the tank shall be powder coated black and then painted to match the frame color.

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

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

FUEL TANK STRAP MATERIAL

The fuel tank straps shall be constructed of #304 stainless steel.

FUEL TANK FILL PORT

The fuel tank fill ports shall be in-line with the left side fill port located in the rearward position of the fuel tank.

FUEL TANK SERVICEABILTY PROVISIONS

The chassis fuel lines shall have additional length provided so the tank can be easily lowered and

	Yes	No

removed for service purposes. The additional 8.00 feet of length shall be located above the fuel tank and shall be coiled and secured. The fuel line fittings shall be pointed towards the right side (curbside) of the chassis.

FUEL TANK DRAIN PLUG

A 0.5 inch NPT drain plug shall be centered in the bottom of the fuel tank.

FRONT AXLE

The front axle shall be a Meritor Easy Steer Non-drive front axle, model number MFS-20. The axle shall include a 3.74 inch drop and a 71.00-inch king pin intersection (KPI). The axle shall include a conventional style hub with a standard knuckle.

FRONT AXLE WARRANTY

The front axle shall be warranted by Meritor for two (2) years with unlimited miles under the general service application. Details of the Meritor warranty are provided on the PDF document attached to this option.

FRONT WHEEL BEARING LUBRICATION

The front axle wheel bearings shall be lubricated with oil. The oil level can be visually checked via clear inspection windows in the front axle hubs.

FRONT SHOCK ABSORBERS

Two (2) Bilstein inert, nitrogen gas filled shock absorbers shall be provided and installed as part of the front suspension system. The shocks shall be a monotubular design and fabricated using a special extrusion method, utilizing a single blank of steel without a welded seam, achieving an extremely tight peak-to-valley tolerance and maintains consistent wall thickness.The monotubular design shall provide superior strength while maximizing heat dissipation and shock life.

The ride afforded through the use of a gas shock is more consistent and shall not deteriorate with heat, the same way a conventional oil filled hydraulic shock would.

The Bilstein front shocks shall include a digressive working piston assembly allowing independent tuning of the compression and rebound damping forces to provide optimum ride and comfort without compromise. The working piston design shall feature fewer parts than most conventional twin tube and “road sensing” shock designs and shall contribute to the durability and long life of the Bilstein shock absorbers.

Proposals offering the use of conventional twin tube or “road sensing” designed shocks shall not be considered.

FRONT SUSPENSION

The front suspension shall include a nine (9) leaf spring pack in which the longest leaf measures 54.00-inch-long and 4.00 inches wide and shall include a military double wrapped front eye. Both spring eyes shall have a case hardened threaded bushing installed with lubrication counter bore and lubrication land off cross bore with grease fitting. The spring capacity shall be rated at 21,500 pounds.

FRONT RIDE HEIGHT ADJUSTMENT

The front ride height shall be increased 1.00 inch by the addition of two (2) 0.50-inch-thick spacers installed between the springs and the axle. These spacers shall be in addition to any spacers that are normally provided for the specific chassis configuration and may cause the frame to not be level when loaded to the rated capacity of the axles.

	Yes	No

STEERING COLUMN/ WHEEL

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

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

ELECTRONIC POWER STEERING FLUID LEVEL INDICATOR

The power steering fluid shall be monitored electronically and shall send a signal to activate an audible alarm and visual warning in the instrument panel when fluid level falls below normal.

POWER STEERING PUMP

The hydraulic power steering pump shall be a TRW PS and shall be gear driven from the engine. The pump shall be a balanced, positive displacement, sliding vane type. The power steering system shall include an oil to air passive cooler.

FRONT AXLE CRAMP ANGLE

The chassis shall have a front axle cramp angle of 48-degrees to the left and 44-degrees to the right.

POWER STEERING GEAR

The power steering gear shall be a TRW model TAS 65 with an assist cylinder.

CHASSIS ALIGNMENT

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

REAR AXLE

The rear axle shall be a Meritor model RS-25-160 single drive axle. The axle shall include precision forged, single reduction differential gearing, and shall have a fire service rated capacity of 27,000 pounds.

The axle shall be built of superior construction and quality components to provide the rugged dependability needed to stand up to the fire industry's demands. The axle shall include rectangular shaped, hot-formed housing with a standard wall thickness of 0.63 of an inch for extra strength and rigidity and a rigid differential case for high axle strength and reduced maintenance.

The axle shall have heavy-duty Hypoid gearing for longer life, greater strength and quieter operation. Industry-standard wheel ends for compatibility with both disc and drum brakes, and unitized oil seal technology to keep lubricant in and help prevent contaminant damage will be used.

REAR AXLE DIFFERENTIAL LUBRICATION

The rear axle differential shall be lubricated with oil.

REAR AXLE WARRANTY

The rear axle shall be warranted by Meritor for two (2) years with unlimited miles under the general

	Yes	No

service application. Details of the Meritor warranty are provided on the PDF document attached to this option.

REAR WHEEL BEARING LUBRICATION

The rear axle wheel bearings shall be lubricated with oil.

REAR AXLE DIFFERENTIAL CONTROL

A driver controlled differential lock shall be installed on the rear axle. This feature shall allow the main differential to be locked and unlocked when encountering poor road or highway conditions, where maximum traction is needed, for use at speeds no greater than 25 MPH. The differential lock shall be controlled by a locking rocker switch on the switch panel. The light on the switch shall illuminate with positive engagement of the differential control.

VEHICLE TOP SPEED

The top speed of the vehicle shall be approximately 68 MPH +/-2 MPH at governed engine RPM.

REAR SUSPENSION

The single rear axle shall feature a Reyco 79KB vari-rate, self-leveling captive slipper type parabolic four (4) leaf, spring suspension with 57.50 inch X 3.00 inch springs. The suspension shall also utilize an auxiliary spring, one (1) adjustable and one (1) fixed torque rod.

The rear suspension capacity shall be rated to 27,000 pounds.

REAR RIDE HEIGHT ADJUSTMENT

The rear ride height shall be increased 1.00 inch by the addition of one (1) 1.00-inch-thick spacer installed between the springs and the axle. This spacer shall be in addition to any spacers that are normally provided for the specific chassis configuration and may cause the frame to not be level when loaded to the rated capacity of the axles.

FRONT TIRE

The front tires shall be Goodyear 315/80R-22.5 20PR "L" tubeless radial G289 WHA highway tread.

The front tire stamped load capacity shall be 20,400 pounds per axle with a nominal speed rating of 68 miles per hour when properly inflated to 130 pounds per square inch.

The Goodyear Intermittent Service Rating maximum load capacity shall match the stamped rating.

The Goodyear Intermittent Service Rating maximum speed capacity shall match the nominal speed rating.

The Goodyear Intermittent Service Rating limits the operation of the emergency vehicle to no more than fifty (50) miles of continuous operation under maximum recommended payload, or without stopping for at least twenty (20) minutes. The emergency vehicle must reduce its speed to no more than 50 MPH after the first fifty (50) miles of travel.

REAR TIRE

The rear tires shall be Goodyear 12R-22.5 16PR "H" tubeless radial G622 RSD mixed service tread.

The rear tire stamped load capacity shall be 27,120 pounds per axle with a nominal speed rating of 75 miles per hour when properly inflated to 120 pounds per square inch.

Yes	No

The Goodyear Intermittent Service Rating maximum load capacity shall be 29,020 pounds per axle with a speed rating of 75 miles per hour when properly inflated to 120 pounds per square inch.

The Goodyear Intermittent Service Rating maximum speed capacity shall match the nominal speed rating.

The Goodyear Intermittent Service Rating limits the operation of the emergency vehicle to no more than fifty (50) miles of continuous operation under maximum recommended payload, or without stopping for at least twenty (20) minutes. The emergency vehicle must reduce its speed to no more than 50 MPH after the first fifty (50) miles of travel.

REAR AXLE RATIO

The rear axle ratio shall be 5.13:1.

TIRE PRESSURE INDICATOR

Each tire installed on the apparatus shall be equipped with a tire pressure monitoring device. The device shall consist of a valve stem cap to with an LED tire alert to indicate tire pressure conditions. The LED shall flash when the tire drops 8 psi below the factory setting.

FRONT WHEEL

The front wheels shall be Alcoa hub piloted, 22.50 inch X 9.00 inch LvL One™ polished aluminum wheels. The hub piloted mounting system shall provide easy installation and shall include two-piece flange nuts. The wheels shall feature one-piece forged strength and shall include Alcoa's Dura-Bright® finish with XBR technology as an integral part of the wheel surface. Alcoa Dura-Bright® wheels keep their shine without polishing. Brake dust, grime and road debris are easily removed by simply cleaning the wheels with soap and water.

REAR WHEEL

The rear wheels shall be Alcoa hub piloted, 22.50 inch X 8.25 inch LvL One™ aluminum wheels with a polished outer surface and Alcoa Dura-Bright® wheel treatment with XBR® technology as an integral part of the wheel. The hub piloted mounting system shall provide easy installation and shall include two-piece flange nuts.

WHEEL TRIM

The front wheels shall include stainless steel lug nut covers and stainless steel baby moons shipped loose with the chassis for installation by the apparatus builder. The baby moons shall have cutouts for oil seal viewing when applicable.

The rear wheels shall include stainless steel lug nut covers and band mounted spring clip stainless steel high hats shipped loose with the chassis for installation by the apparatus builder.

The lug nut covers, baby moons, and high hats shall be RealWheels® brand constructed of 304L grade, non-corrosive stainless steel with a mirror finish. Each wheel trim component shall meet D.O.T. certification.

WHEEL GUARDS

The rear dual wheels shall include a plastic isolator approximately 0.04" installed between the inner and outer wheel hub to help prevent corrosion caused by metal to metal contact. There shall also be a plastic isolator between the axle hub and the wheels on both front and rear axles.

BRAKE SYSTEM

Yes	No

A rapid build-up air brake system shall be provided. The air brakes shall include a two (2) air tank, three (3) reservoir system with a total of 4152 cubic inch of air capacity. A floor mounted treadle valve shall be mounted inside the cab for graduated control of applying and releasing the brakes. An inversion valve shall be installed to provide a service brake application in the unlikely event of primary air supply loss. All air reservoirs provided on the chassis shall be labeled for identification.

The rear axle spring brakes shall automatically apply in any situation when the air pressure falls below 25 PSI and shall include a mechanical means for releasing the spring brakes when necessary. An audible alarm shall designate when the system air pressure is below 60 PSI.

A four (4) sensor, four (4) modulator anti-lock braking system (ABS) shall be installed on the front and rear axles in order to prevent the brakes from locking or skidding while braking during hard stops or on icy or wet surfaces. This in turn shall allow the driver to maintain steering control under heavy braking and in most instances, shorten the braking distance. The electronic monitoring system shall incorporate diagonal circuitry which shall monitor wheel speed during braking through a sensor and tone ring on each wheel. A dash mounted ABS lamp shall be provided to notify the driver of a system malfunction. The ABS system shall automatically disengage the auxiliary braking system device when required. The speedometer screen shall be capable of reporting all active defaults using PID/SID and FMI standards.

Additional safety shall be accommodated through Automatic Traction Control (ATC) which shall be installed on the single rear axle. The ATC system shall apply the ABS when the drive wheels loose traction. The system shall scale the electronic engine throttle back to prevent wheel spin while accelerating on ice or wet surfaces.

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

The Electronic Stability Control (ESC) unit is a functional extension of the electronic braking system. It is able to detect any skidding of the vehicle about its vertical axis as well as any rollover tendency. The control unit comprises an angular-speed sensor that measures the vehicle’s motion about the vertical axis, caused, for instance, by cornering or by skidding on a slippery road surface. An acceleration sensor measures the vehicle’s lateral acceleration. The Controller Area Network (CAN) bus provides information on the steering angle. On the basis of lateral acceleration and steering angle, an integrated microcontroller calculates a theoretical angular speed for the stable vehicle condition.

FRONT BRAKES

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

REAR BRAKES

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

PARK BRAKE

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

PARK BRAKE CONTROL

A Meritor-Wabco manual hand control push-pull style valve shall operate the parking brake system. The control shall be yellow in color.

	Yes	No

The parking brake actuation valve shall be mounted 6.00 inches to the left of center of the dash within easy access of the driver.

AIR DRYER

The brake system shall include a Bendix AD-9 fully self-contained air dryer which shall not require an extra purge tank or additional valves. The AD-9 system shall include a spin-off desiccant filter with a 12-volt, 75-watt thermostatically controlled heating element. The air dryer shall feature 3.9 pounds of premium, high crush strength desiccant which shall be produced with a composition that shall be more effective and longer lasting than other desiccants. It shall also offer protection against contamination and desiccant breakdown. The air dryer shall be mounted behind the battery box on the left-hand side.

FRONT BRAKE CHAMBERS

The front brakes shall be provided with MGM type 24 long stroke brake chambers.

REAR BRAKE CHAMBERS

The rear axle shall include TSE 24/30 H.O.T. (High Output Technology) brake chambers shall convert the energy of compressed air into mechanical force and motion. This shall actuate the brake camshaft, which in turn shall operate the foundational brake mechanism forcing the brake pads against the brake rotor.

AIR COMPRESSOR

The air compressor provided for the engine shall be a Wabco® SS318 single cylinder pass-through drive type compressor which shall be capable of producing 18.7 CFM at 1200 engine RPMs. The air compressor shall feature a higher delivery efficiency translating to more air delivery per horsepower absorbed. The compressor shall include an aluminum cylinder head which shall improve cooling, reduce weight and decrease carbon formation. Superior piston and bore finishing technology shall reduce oil consumption and significantly increasing the system component life.

AIR GOVERNOR

An air governor shall be provided to control the cut-in and cut-out pressures of the engine mounted air compressor. The governor shall be calibrated to meet FMVSS requirements. The air governor shall be located on the air dryer bracket on the left frame rail behind the battery box.

MOISTURE EJECTORS

Manual pet-cock type drain valves shall be installed on all reservoirs of the air supply system.

AIR SUPPLY LINES

The air system on the chassis outside of the cab shall be plumbed with black textile braid covered high tensile steel reinforced wire braided hose with steel reusable fittings. All air plumbing inside the cab shall be reinforced nylon tubing. All drop hoses shall be fiber reinforced neoprene covered hose.

AIR INLET CONNECTION

A Kussmaul air automatic eject connection for the shoreline air inlet shall be supplied.

AIR INLET/ AUTO EJECT CONNECTION COVER

The air auto eject connection shall be red in color.

AIR INLET LOCATION

	Yes	No

The air inlet shall be installed on the left-hand side of the cab above the rear compartment either above or next to the electrical inlet.

AIR INLET/ OUTLET FITTING TYPE

The air connector supplied shall be a 0.25-inch size Tru-Flate Interchange style manual connection which is compatible with Milton 'T' style, Myers 0.25 inch Automotive style and Parker 0.25 inch 10 Series connectors.

AIR TANK SPACERS

There shall be spacers included with the air tank mounting. The spacers shall move the air tanks 1.50 inches inward towards the center of the chassis. This shall provide clearance between the air tanks and the frame for body U-bolt clearance.

REAR AIR TANK MOUNTING

If a combination of wheel base, air tank quantity, or other requirements necessitate the location of one or more air tanks to be mounted rear of the fuel tank, these tank(s) will be mounted perpendicular to frame.

FRAME

The frame shall consist of double rails running parallel to each other with cross members forming a ladder style frame. The frame rails shall be formed in the shape of a "C" channel.
Proposals calculating the frame strength using the "box method" shall not be considered.

Proposals including heat treated rails shall not be considered. Heat treating frame rails produces rails that are not uniform in their mechanical properties throughout the length of the rail. Rails made of high strength, low alloy steel are already at the required yield strength prior to forming the rail.

All relief areas shall be cut in with a minimum 2.00-inch radius at intersection points with the edges ground to a smooth finish to prevent a stress concentration point.

The frame and cross members shall carry a lifetime warranty to the original purchaser. A copy of the frame warranty shall be made available upon request.

Proposals offering warranties for frames not including cross members shall not be considered.

FRAME WARRANTY

Summary of Warranty Terms:
The frame and cross members shall carry a lifetime warranty to the original purchaser. The warranty period shall commence on the date the vehicle is delivered to the first end user.
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FRAME PAINT

The frame shall be powder coated black prior to any attachment of components.

All powder coatings, primers and paint shall be compatible with all metals, pretreatments and primers used. The cross-hatch adhesion test per ASTM D3359 shall not have a fail of more than ten (10) squares. The pencil hardness test per ASTM D3363 shall have a final post-curved pencil hardness of H-2H. The direct impact resistance test per ASTM D2794 shall have an impact resistance of 120.00 inches per pound at 2 mils.

There shall be an RTV type sealant applied to the seams between the frame rail and the frame liner(s) to help prevent water intrusion between the frame rails. The sealant shall be applied to all seams

Yes	No

along the length of the frame and at the front and rear ends of the liner(s). The sealant shall be applied after the frame rails have been assembled and painted.

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

The chassis under carriage consisting of frame, axles, driveline running gear, air tanks and other chassis mounted components shall be painted the primary/lower cab color. Paint shall be applied prior to airline and electrical wiring installation.

FRONT BUMPER

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

FRONT BUMPER EXTENSION LENGTH

The front bumper shall be extended approximately 21.00 inches ahead of the cab.

FRONT BUMPER SUCTION PROVISION

The bumper apron shall include a 5.00-inch stainless steel pipe intended for use as a suction intake for the pump. The suction pipe shall be routed from the right hand front bumper area to the area rear of the front axle near the back of the cab.

The front of the suction pipe shall be designed to extend 1.50 inches horizontally through the face of the bumper on the right-hand side.

The forward end of the suction pipe shall be finished with a 5.00-inch National Pipe Thread (NPT). The rear of the suction shall include a Victaulic groove for connecting to the pump plumbing. The suction pipe shall also include a 0.50 inch NPT port intended as a primer assist connection.

The apparatus manufacturer shall plumb the suction pipe to the pump and shall provide all valves as required.

FRONT BUMPER APRON

The 21.00 inch extended front bumper shall include an apron constructed of 0.19-inch-thick embossed aluminum tread plate.

The apron shall be installed between the bumper and the front face of the cab affixed using stainless steel bolts attaching the apron to the top bumper flange.

FRONT BUMPER COMPARTMENT CENTER

The front bumper shall include a compartment in the bumper apron located in the center between the frame rails which may be used as a hose well. The compartment shall be constructed of 0.13 inch 5052-H32 grade aluminum and shall include drain holes in the bottom corners to allow excess moisture to escape.

MECHANICAL SIREN

The front bumper shall include an electro mechanical Federal Q2B™ siren, which shall be streamlined, chrome-plated and shall produce 123 decibels of sound at 10.00 feet. The Q2B™ siren produces a distinctive warning sound that is recognizable at long distances. A unique clutch design provides a longer coast down sound while reducing the amp draw to 100 amps. The siren shall measure 10.50 inches wide X 10.00 inches high X 14.00 inches deep. The siren shall include a pedestal mount to

Yes	No

surface mount on a horizontal surface.

MECHANICAL SIREN LOCATION

The siren shall be pedestal mounted on the bumper apron on the furthest outboard section of the bumper on the driver side.

AIR HORN

The chassis shall include two (2) Hadley brand E-Tone air horns which shall measure 24.00 inches long with a 6.00-inch round flare. The air horns shall be trumpet style with a chrome finish on the exterior and a painted finish deep inside the trumpet. Air horns shall be activated by lanyard in the cab in a Y configuration.

AIR HORN LOCATION

The air horns shall be recess mounted in the front bumper face on the left side of the bumper in the inboard and outboard positions relative to the left-hand frame rail.

AIR HORN RESERVOIR

One (1) air reservoir, with a 1200 cubic inch capacity, shall be installed on the chassis to act as a supply tank for operating air horns. The reservoir shall be isolated with a 90 PSI pressure protection valve on the reservoir supply side to prevent depletion of the air to the air brake system.

ELECTRONIC SIREN SPEAKER

There shall be one (1) Cast Products Inc. model SA4301, 100-watt speaker provided. The speaker shall measure 6.20 inches tall X 7.36 inches wide X 3.06 inches deep. The speaker shall include a flat mounting flange which shall be polished aluminum.

ELECTRONIC SIREN SPEAKER LOCATION

The electronic siren speaker shall be located on the front bumper face in the center position between the frame rails.

FRONT BUMPER TOW EYES

The bumper shall include two (2) chrome plated tow eyes shall be installed above the front bumper. The eyes shall be fabricated from 0.75-inch-thick #1020 ASTM-A36 hot rolled steel. The inside diameter of the tow eye shall be 2.00 inches and shall include a chamfered edge.

CAB TILT SYSTEM

The entire cab shall be capable of tilting approximately 45-degrees to allow for easy maintenance of the engine and transmission. The cab tilt pump assembly shall be located on the right side of the chassis above the battery box.

The electric-over-hydraulic lift system shall include an ignition interlock and red cab lock down indicator lamp on the tilt control which shall illuminate when holding the “Down” button to indicate safe road operation.

It shall be necessary to activate the master battery switch and set the parking brake in order to tilt the cab. As a third precaution the ignition switch must be turned off to complete the cab tilt interlock safety circuit.

Two (2) spring-loaded hydraulic hold down hooks located outboard of the frame shall be installed to hold the cab securely to the frame. Once the hold-down hooks are set in place, it shall take the application of pressure from the hydraulic cab tilt lift pump to release the hooks.

	Yes	No

Two (2) cab tilt cylinders shall be provided with velocity fuses in each cylinder port. The cab tilt pivots shall be 1.90 inch ball and be anchored to frame brackets with 1.25 inch diameter studs.

A steel safety channel assembly, painted safety yellow shall be installed on the right side cab lift cylinder to prevent accidental cab lowering. The safety channel assembly shall fall over the lift cylinder when the cab is in the fully tilted position. A cable release system shall also be provided to retract the safety channel assembly from the lift cylinder to allow the lowering of the cab.

CAB TILT LIMIT SWITCH

A cab tilt limit switch shall be installed. The switch will effectively limit the travel of the cab when being tilted. The limit adjustment of the switch shall be preset by the chassis manufacturer to prevent damage to the cab or any bumper mounted option mounted in the cab tilt arc. Further adjustment to the limit by the apparatus manufacturer shall be available to accommodate additional equipment.

CAB TILT CONTROL RECEPTACLE

A six (6) pin Deutsch receptacle that includes a cap shall be installed in the left-hand side middle front step in the rear position to provide a place to plug in the cab tilt remote control pendant.

The remote-control pendant shall include 20.00 feet of cable with a mating Deutsch connector. The remote-control pendant shall be shipped loose with the chassis.

GLASS TINT FRONT

The windows located in the front of the cab shall have an automotive tint which shall allow seventy-five percent (75%) light transmittance.

GLASS TINT REAR

The windows located in the rear of the cab shall have an automotive tint which shall allow twenty percent (20%) light transmittance.

CLIMATE CONTROL

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

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

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

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

A gravity drain system shall be provided that is capable of evacuating condensate from the vehicle

	Yes	No

while on a slope of up to a 13% grade in any direction.

The air conditioning system plumbing shall be a mixture of custom bent zinc coated steel fittings and Aero-quip GH134 flexible hose with Aeroquip EZ-Clip fittings.

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

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

***Performance data is based on testing performed by an independent third party test facility using a medium four-door 10" Raised roof Gladiator chassis equipped with an ISL engine.*

CLIMATE CONTROL DRAIN

The climate control system shall include a gravity drain for water management. The gravity drain shall remove condensation from the air conditioning system without additional mechanical assistance.

CLIMATE CONTROL ACTIVATION

The heating, defrosting and air conditioning controls shall be on the dash next to driver panel, in a position which is easily accessible to the driver. The climate control shall be activated by a rotary switch.

HVAC OVERHEAD COVER PAINT

The overhead HVAC cover shall be painted with a multi-tone silver gray texture finish.

A/C CONDENSER LOCATION

A roof mounted A/C condenser shall be installed centered on the cab forward of the raised roof against the slope rise.

A/C COMPRESSOR

The air-conditioning compressor shall be a belt driven, engine mounted compressor. The compressor shall be compatible with R134-a refrigerant.

CAB CIRCULATION FANS FRONT

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

UNDER CAB INSULATION

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

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

INTERIOR TRIM FLOOR

	Yes	No

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

INTERIOR TRIM

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

REAR WALL INTERIOR TRIM

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

HEADER TRIM

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

TRIM CENTER DASH

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

TRIM LH DASH

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

TRIM RH DASH

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

ENGINE TUNNEL TRIM

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

ENGINE TUNNEL MOUNTING PLATE

One 1/2" poly plate covering the top of the engine tunnel for mounting equipment shall be supplied.

POWER POINT DASH MOUNT

The cab shall include two (2) 12-volt cigarette lighter type receptacles in the cab dash to provide a

	Yes	No

power source for 12-volt electrical equipment. The receptacles shall be wired battery direct.

The cab shall also include two (2) Dual universal serial bus (USB) charging receptacles in the cab dash rocker switch cutout to provide a power source for USB chargeable electrical equipment. Each USB receptacle shall include one (1) USB port capable of a 5 Volt-1-amp output and one (1) USB port capable of a 5 Volt-2.1-amp output. The receptacles shall be wired battery direct and include a backlit legend.

STEP TRIM

Each cab entry door shall include a three-step entry. The first step closest to the ground shall be constructed of polished 5052 H32 aluminum Grip Strut® grating with angled outer corners. The grating shall allow water and other debris to flow through rather than becoming trapped within the stepping surface. The lower step shall be mounted to a frame which is integral with the construction of the cab for rigidity and strength. The middle step shall be integral with the cab construction and shall be trimmed in 0.08-inch-thick 3003-H22 embossed aluminum tread plate.

UNDER CAB ACCESS DOOR

The cab shall include an aluminum access door in the left crew step riser painted to match the cab interior color with a push and turn latch. The under cab access door shall provide access to the diesel exhaust fluid fill.

INTERIOR DOOR TRIM

The interior trim on the doors of the cab shall consist of an aluminum panel constructed of Marine Grade 5052-H32 0.13 of an inch thick aluminum plate. The door panels shall include a painted finish.

CAB DOOR TRIM REFLECTIVE

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

INTERIOR GRAB HANDLE "A" PILLAR

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

INTERIOR GRAB HANDLE FRONT DOOR

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

INTERIOR GRAB HANDLE REAR DOOR

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

INTERIOR SOFT TRIM COLOR

The cab interior soft trim surfaces shall be gray in color.

INTERIOR TRIM SUNVISOR

	Yes	No

The header shall include two (2) sun visors, one each side forward of the driver and officer seating positions above the windshield. Each sun visor shall be constructed of Masonite and covered with padded vinyl trim.

INTERIOR FLOOR MAT COLOR

The cab interior floor mat shall be gray in color.

CAB PAINT INTERIOR DOOR TRIM

The inner door panel surfaces shall be painted with multi-tone silver gray texture finish.

HEADER TRIM INTERIOR PAINT

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

TRIM CENTER DASH INTERIOR PAINT

The entire center dash shall be coated with multi-tone silver gray texture finish. Any accessory pods attached to the dash shall also be painted this color.

TRIM LH DASH INTERIOR PAINT

The left-hand dash shall be painted with a multi-tone silver gray texture finish.

TRIM RIGHT HAND DASH INTERIOR PAINT

The right-hand dash shall be painted with multi-tone silver gray texture finish.

DASH PANEL GROUP

The main center dash area shall include three (3) removable panels located one (1) to the right of the driver position, one (1) in the center of the dash and one (1) to the left of the officer position. The center panel shall be within comfortable reach of both the driver and officer.

SWITCHES CENTER PANEL

The center dash panel shall include twelve (12) rocker switch positions in a six (6) over six (6) switch configuration in the left portion of the panel.

A rocker switch with a blank legend installed directly above shall be provided for any position without a switch and legend designated by a specific option. The non-specified switches shall be two-position, black switches with a green indicator light. Each blank switch legend can be custom engraved by the body manufacturer. All switch legends shall have backlighting provided. Switch layout to match currant engine configuration.

SWITCHES LEFT PANEL

The left dash panel shall include thirteen (13) switches. There shall be six (6) switches across the top of the panel and seven (7) across the bottom of the panel. Six (6) of the top row of switches shall be rocker type. Four (4) of the lower row of switches shall be rocker type and the left three (3) shall be the windshield wiper/washer control switch, instrument lamp dimmer switch, and headlight switch. Switch layout to match currant engine configuration.

A rocker switch with a blank legend installed directly above shall be provided for any position not designated by a specific option. The non-designated switches shall be two-position, black switches

	Yes	No

with a green indicator light. Each blank switch legend can be custom engraved by the body manufacturer. All switch legends shall have backlighting provided.

SWITCHES RIGHT PANEL

The right dash panel shall include rocker switches and legends to match current engine configuration.

SEAT BELT WARNING

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

The warning system shall activate when any seat is occupied with a minimum of 60 pounds and the corresponding seat belt remains unfastened. The warning system shall also activate when any seat is occupied and the corresponding seat belt was fastened in an incorrect sequence. Once activated, the visual indicators and audible alarm shall remain active until all occupied seats have the seat belts fastened.

SEAT MATERIAL

The seats shall include a covering of high strength, wear resistant fabric made of durable ballistic polyester. A PVC coating shall be bonded to the back side of the material to help protect the seats from UV rays and from being saturated or contaminated by fluids. Common trade names for this material are Imperial 1200 and Durawear.

SEAT COLOR

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

SEAT DRIVER

The driver's seat shall be an H.O. Bostrom model seat with air suspension. The four-way seat shall feature 3.00-inch vertical travel air suspension and manual fore and aft adjustment with 5.00 inches of travel. The suspension control shall be located on the seat below the left front corner of the bottom cushion. The seat shall also feature integral springs to isolate shock.

The seat position shall include a three-point shoulder harness with lap belt and an automatic retractor attached to the cab. The buckle portion of the seat belt shall be mounted on a semi-rigid stalk extending from the seat base within easy reach of the occupant.

The minimum vertical dimension from the seat H-point to the ceiling for this belted seating position shall be 37.00 inches measured with the seat suspension height adjusted to the upper limit of its travel.

This model of seat shall have successfully completed the static load tests set forth by FMVSS 207, 209, and 210 in effect at the time of manufacture. This testing shall include a simultaneous forward load of 3000 pounds each on the lap and shoulder belts and twenty (20) times the weight through the center of gravity.

The materials used in construction of the seat shall also have successfully completed testing with regard to the flammability of materials used in the occupant compartments of motor vehicles as outlined in FMVSS 302, of which dictates the allowable burning rate of materials in the occupant compartments of motor vehicles.

SEAT BACK DRIVER

The driver's seat shall feature a two (2) way adjustable lumbar support and offer an infinite fully

Yes	No

reclining adjustable titling seat back. The seat back shall also feature a contoured head rest.

SEAT MOUNTING DRIVER

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

OCCUPANT PROTECTION DRIVER

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

The driver's seating area APS shall include:

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

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

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

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

SEAT OFFICER

The officer's seat shall be an H.O. Bostrom model seat with air suspension with All Belts to seat (ABTS). The four-way seat shall feature a 3.00 inches' vertical travel air suspension and manual fore and aft adjustment with 5.00 inches of travel. The suspension control shall be located on the seat below the left front corner of the bottom cushion. The seat shall also feature integral springs to isolate shock.

The seat shall feature an all belts to seat (ABTS) style of safety restraint. The ABTS feature shall include a three-point shoulder harness with the lap belt and automatic retractor as an integral part of the seat assembly. The buckle portion of the seat belt shall extend from the seat base towards the driver position within easy reach of the occupant.

This model of seat shall have successfully completed the static load tests set forth by FMVSS 207/210. This testing shall include a simultaneous forward load of 3000 pounds each on the lap and shoulder belts and twenty (20) times the weight through the center of gravity. This model of seat installed in the cab model, as specified, shall have successfully completed the dynamic sled testing using FMVSS 208 as a guide with the following accommodations. In order to reflect the larger size outfitted firefighters, the test dummy used shall be a 95th percentile hybrid III male weighing 225 pounds rather than the 50th percentile male dummy weighing 165 pounds as referenced in FMVSS 208.

The materials used in construction of the seat shall also have successfully completed testing with regard to the flammability of materials used in the occupant compartments of motor vehicles as outlined in FMVSS 302, of which dictates the allowable burning rate of materials in the occupant compartments of motor vehicles.

	Yes	No

SEAT BACK OFFICER

The officer's seat back shall include an IMMI brand SmartDock® Gen 2 hands-free self-contained breathing apparatus (SCBA) holder. The hands-free holder shall meet NFPA 1901-03 9G dynamic requirements for cylinder restraint systems for use in crew compartments of emergency response vehicles. The bracket shall accommodate and secure most types of self-contained breathing apparatus cylinders.

The hands-free holder shall consist of a back plate, bottom cradle, non-marring top claws, and claw height adjustment knob. The height adjustment knob shall allow for easy adjustment of the claws to the SCBA. The hands-free holder's claws shall lock from inertial forces to prevent the SCBA from becoming a projectile in the event of a crash to meet the NFPA 1901-03 standard for SCBA retention. The SCBA holder shall offer single-motion insertion into the claws and hands-free release when the SCBA fitted seat occupant rises.

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

SEAT MOUNTING OFFICER

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

OCCUPANT PROTECTION OFFICER

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

The officer's seating area APS shall include:

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

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

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

SEAT BELT ORIENTATION CREW

The crew position seat belts shall follow the standard orientation which extends from the outboard shoulder extending to the inboard hip. ABTS

SEAT REAR FACING OUTER LOCATION

The crew area shall include two (2) rear facing crew seats, which include one (1) located directly behind the left side front seat and one (1) located directly behind the right side front seat.

SEAT CREW REAR FACING OUTER

The crew area shall include a seat in the rear facing outboard position which shall be a H.O. Bostrom

	Yes	No

Series Firefighter model seat. The seat shall feature a tapered and padded seat, and cushion. The seat and cushion shall be spring load hinged and compact in design for additional room and shall remain in the stored position until occupied.

The seat shall feature an all belts to seat (ABTS) style of safety restraint. The ABTS feature shall include a three-point shoulder harness with the lap belt and automatic retractor as an integral part of the seat assembly. The buckle portion of the seat belt shall extend from the seat base towards the driver position within easy reach of the occupant.

The minimum vertical dimension from the seat H-point to the ceiling for each belted seating position shall be 35.00 inches.

This model of seat shall have successfully completed the static load tests by FMVSS 207/210. This testing shall include a simultaneous forward load of 3000 pounds each on the lap and shoulder belts and twenty (20) times the weight through the center of gravity. This model of seat installed in the cab model, as specified, shall have successfully completed the dynamic sled testing using FMVSS 208 as a guide with the following accommodations. In order to reflect the larger size outfitted firefighters, the test dummy used shall be a 95th percentile hybrid III male weighing 225 pounds rather than the 50th percentile male dummy weighing 165 pounds as referenced in FMVSS 208. The model of seats shall also have successfully completed the flammability of materials used in the occupant compartments of motor vehicles as outlined in FMVSS 302, of which decides the burning rate of materials in the occupant compartments of motor vehicles.

SEAT BACK REAR FACING OUTER

The crew area seat backs shall include an IMMI brand SmartDock® Gen 2 hands-free self-contained breathing apparatus (SCBA) holder. The hands-free holder shall meet NFPA 1901-03 9G dynamic requirements for cylinder restraint systems for use in crew compartments of emergency response vehicles. The bracket shall accommodate and secure most types of self-contained breathing apparatus cylinders.

The hands-free holder shall consist of a back plate, bottom cradle, non-marring top claws, and claw height adjustment knob. The height adjustment knob shall allow for easy adjustment of the claws to the SCBA. The hands-free holder's claws shall lock from inertial forces to prevent the SCBA from becoming a projectile in the event of a crash to meet the NFPA 1901-03 standard for SCBA retention. The SCBA holder shall offer single-motion insertion into the claws and hands-free release when the SCBA fitted seat occupant rises.

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

OCCUPANT PROTECTION RFO

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

Each rear facing outer seating position APS shall include:

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

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

	Yes	No

SEAT FORWARD FACING CENTER LOCATION

The crew area shall include two (2) forward facing center crew seats with both located at the center of the rear wall.

SEAT CREW FORWARD FACING CENTER

The crew area shall include a seat in the forward-facing center position which shall be a H.O. Bostrom Series Firefighter model seat. The seat shall feature a tapered and padded seat, and cushion. The seat and cushion shall be spring load hinged and compact in design for additional room and shall remain in the stored position until occupied.

The seat shall feature an all belts to seat (ABTS) style of safety restraint. The ABTS feature shall include a three-point shoulder harness with the lap belt and automatic retractor as an integral part of the seat assembly. The buckle portion of the seat belt shall extend from the seat base towards the driver position within easy reach of the occupant.

SEAT BACK FORWARD FACING CENTER

The crew area seat backs shall include an IMMI brand SmartDock® Gen 2 hands-free self-contained breathing apparatus (SCBA) holder. The hands-free holder shall meet NFPA 1901-03 9G dynamic requirements for cylinder restraint systems for use in crew compartments of emergency response vehicles. The bracket shall accommodate and secure most types of self-contained breathing apparatus cylinders.

The hands-free holder shall consist of a back plate, bottom cradle, non-marring top claws, and claw height adjustment knob. The height adjustment knob shall allow for easy adjustment of the claws to the SCBA. The hands-free holder's claws shall lock from inertial forces to prevent the SCBA from becoming a projectile in the event of a crash to meet the NFPA 1901-03 standard for SCBA retention. The SCBA holder shall offer single-motion insertion into the claws and hands-free release when the SCBA fitted seat occupant rises.

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

OCCUPANT PROTECTION FFC

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

Each forward facing center seating position APS shall include:

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

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

SEAT FRAME FORWARD FACING

The forward facing center seating positions shall include a full width seat frame located and installed at the rear wall. The seat frame shall span the available space on the rear wall. The seat frame shall be 12.38 inches high X 22.00 inches deep. The seat frame shall be constructed of Marine Grade 5052-

	Yes	No

H32 0.19-inch-thick aluminum plate. The seat box shall be painted with the same color as the remaining interior.

SEAT FRAME FORWARD FACING STORAGE ACCESS

There shall be two (2) access points to the storage area centered on the front of the seat frame. Each access point shall be covered by a hinged door to allow access for storage in the seat box. Seat box will extend the entire span of the rear cab wall.

SEAT MOUNTING FORWARD FACING CENTER

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

CAB FRONT UNDERSEAT STORAGE ACCESS DOOR

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

SEAT COMPARTMENT DOOR FINISH

All under seat storage compartment access doors shall have a multi-tone silver gray texture finish.

WINDSHIELD WIPER SYSTEM

The cab shall include a dual arm wiper system which shall clear the windshield of water, ice and debris. There shall be two (2) windshield wipers which shall be affixed to a radial wet arm. The system shall include a single motor which shall initiate the arm in which both the left hand and right hand windshield wipers are attached, initiating a back and forth motion for each wiper. The wiper motor shall be activated by an intermittent wiper control located within easy reach of the driver's position.

ELECTRONIC WINDSHIELD FLUID LEVEL INDICATOR

The windshield washer fluid level shall be monitored electronically. When the washer fluid level becomes low the yellow "Check Message Center" indicator light on the instrument panel shall illuminate and the message center in the dual air pressure gauge shall display a "Check Washer Fluid Level" message.

CAB DOOR HARDWARE

The cab entry doors shall be equipped with exterior pull handles, suitable for use while wearing firefighter gloves. The handles shall be made of aluminum with a chrome plated finish.

The interior exit door handles shall be flush paddle type with a black finish, which are incorporated into the upper door panel.

All cab entry doors shall include locks which are keyed alike. The door locks shall be designed to prevent accidental lockout.

DOOR LOCKS

Each cab entry door shall include a manually operated door lock. Each door lock may be actuated from the inside of the cab by means of a red knob located on the paddle handle of the respective door or by using a TriMark key from the exterior. The door locks are designed to prevent accidental lock out.

DOOR LOCK LH REAR CAB COMPARTMENT

The left-hand side rear compartment shall feature a manual door lock.

DOOR LOCK RH REAR CAB COMPARTMENT

	Yes	No

The right-hand side rear compartment shall feature a manual door lock.

GRAB HANDLES

The cab shall include one (1) 18.00-inch three-piece knurled stainless steel, anti-slip exterior assist handle, installed behind each cab entry door. The grab handle shall be made of stainless steel with a knurled finish to enable non-slip assistance with a gloved hand. Each end of the grab handle will include one (1) chrome plated stanchion that shall allow the grab handle to be fastened to the cab exterior. Each grab handle shall include a stainless-steel scuff plate to help protect the cab paint from damage.

REARVIEW MIRRORS

Retrac Aerodynamic West Coast style single vision mirror heads model 613275 shall be provided and installed on each of the front cab doors.

The mirrors shall be mounted via 1.00-inch diameter tubular stainless steel arms to provide a rigid mounting to reduce mirror vibration.

The mirrors shall measure 8.00 inches wide X 19.00 inches high and shall include an 8.00 inch convex mirrors with a stainless steel back, model 980-4, installed below the flat glass to provide a wider field of vision. The flat mirrors shall be motorized with remote horizontal and vertical adjustment. The control switches shall be mounted within easy reach of the driver. The convex mirrors shall be manually adjustable. The flat mirror glass shall be heated for defrosting in severe cold weather conditions.

The mirrors shall be constructed of a vacuum formed chrome plated ABS plastic housing that is corrosion resistant and shall include the finest quality non-glare glass.

REARVIEW MIRROR HEAT SWITCH

The heat for the rearview mirrors shall be controlled through a rocker switch on the dash in the switch panel.

EXTERIOR TRIM REAR CORNER

There shall be mirror finish stainless steel scuff plates on the outside corners at the back of the cab. The stainless-steel plate shall be affixed to the cab using two sided adhesive tape.

TRIM ROOF

The rear of the cab roof shall include 3003-H22 bright aluminum embossed tread plate which is 0.08 inches thick. This plate shall be intended for reinforcement value and shall be 48.00 inches long starting from the rear edge of the roof forward and shall be the full width of the flat portion of the roof centered left to right.

The tread plate shall be held in place using stainless steel fasteners and shall be sealed with silver silicone caulk around the perimeter of the tread plate and at each mounting screw.

CAB FENDER

Full width wheel well liners shall be installed on the extruded cab to limit road splash and enable easier cleaning. Each two-piece liner shall consist of an inner liner 16.00 inches wide made of vacuum formed ABS composite and an outer fenderette 3.50 inches wide made of 14 gauge 304 polished stainless steel.

MUD FLAPS FRONT

	Yes	No

The front wheel wells shall have mud flaps installed on them.

IGNITION

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

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

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

BATTERY

The single start electrical system shall include six (6) Harris BCI 31 925 CCA batteries with a 210 minute reserve capacity and 4/0 welding type dual path starter cables per SAE J541.

BATTERY TRAY

The batteries shall be installed within two (2) stainless steel battery trays located on the left side and right side of the chassis, securely bolted to the frame rails. The battery trays shall be coated with the same material as the frame.

The battery trays shall include drain holes in the bottom for sufficient drainage of water. A durable, non-conducting, interlocking mat made by Dri-Dek shall be installed in the bottom of the trays to allow for air flow and help prevent moisture build up. The batteries shall be held in place by non-conducting phenolic resin hold down boards and shall have easy access to remove all batteries.

BATTERY BOX COVER

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

BATTERY CABLE

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

BATTERY JUMPER STUD

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

ALTERNATOR

The charging system shall include a 320 amp Leece-Neville 12-volt alternator. The alternator shall include a self-exciting integral regulator.

BATTERY CONDITIONER

A Kussmaul 35/10 battery conditioner shall be supplied. The battery conditioner shall provide a 35-amp output for the chassis batteries and a 10 amp battery saver output. The battery conditioner shall be mounted in the cab in the area between the driver seat and the LH rear facing outer seat position.

	Yes	No

BATTERY CONDITIONER DISPLAY

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

ELECTRICAL INLET

A Kussmaul 20-amp super auto-eject electrical receptacle shall be supplied. It shall automatically eject the plug when the starter button is depressed.

A single item or an addition of multiple items must not exceed the rating of the electric inlet that it's connected to.

Amp Draw Reference List:
Kussmaul 1000 Charger - 3.5 Amps
Kussmaul 1200 Charger - 10 Amps
Kussmaul 35/10 Charger - 10 Amps
1000W Engine Heater - 8.33 Amps
1500W Engine Heater - 12.5 Amps
120V Air Compressor - 4.2 Amps

ELECTRICAL INLET LOCATION

An electrical inlet shall be installed on the left-hand side of the cab near the rear compartment, in a location provided by the buyer.

ELECTRICAL INLET CONNECTION

The electrical inlet shall be connected to the battery conditioner.

ELECTRICAL INLET COLOR

The electrical inlet connection shall include a red cover.

HEADLIGHTS

The cab front shall include four (4) rectangular LED headlamps with separate high and low beams mounted in bright chrome bezels.

FRONT TURN SIGNALS

The front fascia shall include two (2) Whelen model 600 4.00 inch X 6.00 inch programmable LED amber turn signals which shall be installed in a chrome bezel outboard of the front warning and above the headlamps.

HEADLIGHT LOCATION

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

SIDE TURN/MARKER LIGHTS

The sides of the cab shall include two (2) LED round side marker lights which shall be provided just behind the front cab radius corners.

MARKER AND ICC LIGHTS

In accordance with FMVSS, there shall be five (5) LED cab marker lamps designating identification,

	Yes	No

center and clearance provided. These lights shall be installed on the face of the cab within full view of other vehicles from ground level.

HEADLIGHT AND MARKER LIGHT ACTIVATION

The headlights and marker lights shall be controlled through a rocker switch within easy reach of the driver. There shall be a dimmer switch within easy reach of the driver to adjust the brightness of the dash lights. The headlamps shall be equipped with the "Daytime Running" light feature, which shall illuminate the headlights to 80% brilliance when the battery master switch is in the "On" position and the parking brake is released.

GROUND LIGHTS

Each door shall include an LED NFPA compliant ground light mounted to the under side of the cab step below each door. The lights shall include a polycarbonate lens, a housing which is vibration welded and LEDs which shall be shock mounted for extended life. The ground lighting shall be activated by the opening of the respective door as well as being activated when the parking brake is set.

LOWER CAB STEP LIGHTS

The middle step located at each door shall include a recess mounted 4.00 inch round LED light which shall activate with the opening of the respective door.

INTERMEDIATE STEP LIGHTS

The intermediate step well area at each door shall include an LED light within a chrome housing. The Egress step lights shall provide visibility to the step well area for the first step exiting the vehicle. The Egress step lights shall activate with Entry step lighting.

ENGINE COMPARTMENT LIGHT

There shall be an LED NFPA compliant light mounted under the engine tunnel for area work lighting on the engine. The light shall include a polycarbonate lens, a housing which is vibration welded and a bulb which shall be shock mounted for extended life. The light shall activate automatically when the cab is tilted.

LIGHTBAR PROVISION

There shall be one (1) light bar installed on the cab roof. The light bar installation shall include mounting and wiring to a control switch on the cab dash.

CAB FRONT LIGHTBAR

The light bar provisions shall be for one (1) Whelen Freedom IV light bar mounted centered on the front of the cab roof. The light bar shall be 72.00 inches in length. Light bar will consist of red and Amber LED models TBD by the Chief. The cable shall exit the light bar on the right side of the cab.

TRAFFIC CONTROL

There shall be one (1) GTT (Global Traffic Technologies) Opticom model 795H infrared traffic control optical emitter mounted in the light bar on the front of the cab roof. The emitter shall be activated by a lighted rocker switch on dash and shall be deactivated when the parking brake is applied.

LIGHTBAR SWITCH

The light bar shall be controlled by a rocker switch located on the switch panel. There shall be an

	Yes	No

additional rocker switch to control the amber lights only. The amber light switch shall be able to be activated at all times. The switches shall be clearly labeled for identification.

FRONT SCENE LIGHTS

The front of the cab shall include two (2) Whelen model Pioneer PFA2 contour roof mount scene lights installed on the brow of the cab.

Each lamp head shall have two (2) 12 volt high intensity LED banks. Each lamp head shall draw 6.0 amps and generate 6,000 lumens. Each lamp head shall be adjustable up to 20-degrees. Each lamp head shall measure 4.25 inches in height X 14.00 inches in width. The lamp heads and brackets shall be powder coated white.

FRONT SCENE LIGHTS ACTIVATION

The front scene lighting shall be activated by a rocker switch.

FRONT SCENE LIGHT LOCATION

There shall be two (2) scene lights mounted to the front brow of the cab inboard of the outer front marker lights.

SIDE SCENE LIGHTS

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

SIDE SCENE LIGHT LOCATION

The scene lighting located on the left and right sides of the cab shall be mounted rearward of the cab “B” pillar in the 10.00 inch raised roof portion of the cab between the front and rear crew doors.

SIDE SCENE ACTIVATION

The scene lights shall be activated by two (2) rocker switches located in the switch panel, one (1) for each light, and by opening the respective side cab doors.

INTERIOR OVERHEAD LIGHTS

The cab shall include a two-section, red and clear Weldon LED dome lamp located over each door. The dome lamps shall be rectangular in shape and shall measure approximately 7.00 inches in length X 3.00 inches in width with a black colored bezel. The clear portion of each lamp shall be activated by opening the respective door and both the red and clear portion can be activated by individual push lenses on each lamp.

An additional two-section, red and clear Weldon LED dome lamp shall be located over the engine tunnel which can be activated by individual switches on the lamp.

DO NOT MOVE APPARATUS LIGHT

The front headliner of the cab shall include a flashing red Whelen Ion LED light clearly labeled "Do Not Move Apparatus". In addition to the flashing red light, an audible alarm shall be included which shall sound while the light is activated.

The flashing red light shall be located centered left to right for greatest visibility.

The light and alarm shall be interlocked for activation when either a cab door is not firmly closed or an apparatus compartment door is not closed, and the parking brake is released.

	Yes	No

12 VOLT WIRING – CONVENTIONAL HARDWIRED

All of the emergency electrical equipment shall be served by circuits separate and distinct from the vehicle circuits. Body wiring shall be thermo plastic harness type, GXL (125 degree Centigrade) color and/or number or function coded. The wiring shall be grease, oil and moisture resistant, routed in convoluted looms and in protected locations. Wires and looms shall be neatly and securely fastened, and all apertures with proper grommets for passing wiring.

Solderless insulated crimp connectors shall be provided. Wire nut, insulation displacement, and insulation piercing connections shall not be used. All electrical connections that are exposed to the elements shall be of the heat shrink sealant type **(NO EXCEPTIONS)**.

The body electrical shall be designed for controlling the electrical devices of the vehicle. It shall consist of several automotive style relays, circuit breakers, and electrical devices strategically located throughout the vehicle . Microprocessor controlled solid state modules of any kind shall not be utilized **(NO EXCEPTION)**.

MASTER WARNING SWITCH

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

INBOARD FRONT WARNING LIGHTS

The cab front fascia shall include two (2) Whelen 600 series Super LED front warning lights in the left and right inboard positions. The lights shall feature multiple flash patterns including steady burn for solid colors and multiple flash patterns for split colors. The lights shall be mounted to the front fascia of the cab within a chrome bezel.

INBOARD FRONT WARNING LIGHTS COLOR

The warning lights mounted on the cab front fascia in the inboard positions shall be red with a clear lens.

FRONT WARNING SWITCH

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

INTERSECTION WARNING LIGHTS

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

INTERSECTION WARNING LIGHTS COLOR

The intersection lights shall be red with a clear lens.

INTERSECTION WARNING LIGHTS LOCATION

The intersection lights shall be mounted on the side of the bumper.

SIDE AND INTERSECTOR WARNING SWITCH

Yes	No

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

TANK LEVEL LIGHTS

There shall be two (2) Whelen PSTANK water level light strips surface mounted vertically, one (1) on each side of the cab behind the rear cab doors.

The light strips shall feature four (4) colors of LED lights to indicate the fluid level of a tank. The colors from top to bottom shall be green, blue, amber, and red.

INTERIOR DOOR OPEN WARNING LIGHTS

The interior of each door shall include one (1) red Whelen 500 Series TIR6™ Super-LED® warning light located on the door panel. Each light shall activate with a flashing pattern when the door is in the open position to serve as a warning to oncoming traffic.

SIREN CONTROL HEAD

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

AIR HORN ACTIVATION

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

MECHANICAL SIREN ACTIVATION

The mechanical siren shall be actuated by a Linemaster model SP491-S81 foot switch mounted in the front section of the cab for use by the driver and a rocker switch in the panel on the officer's side dash. A red momentary siren brake rocker switch shall be provided in the switch panel on the dash.

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

BACK-UP ALARM

A Preco-Matic model 1059 dual function, dual sound backup alarm shall be installed at the rear of the chassis with an auto-adjusting output level of 87 dB to 112 dB. The alarm shall automatically activate when the transmission is placed in reverse.

INSTRUMENTATION

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

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

	Yes	No

The instrument panel shall contain the following gauges:

One (1) three-movement gauge displaying vehicle speed, fuel level, and Diesel Exhaust Fluid (DEF) level. The primary scale on the speedometer shall read from 0 to 100 MPH, and the secondary scale on the speedometer shall read from 0 to 160 KM/H. The scale on the fuel and DEF level gauges shall read from empty to full as a fraction of full tank capacity. Red indicator lights in the gauge and an audible alarm shall indicate low fuel or low DEF at 1/8th tank level.

One (1) three-movement gauge displaying engine RPM, and primary and secondary air system pressures shall be included. The scale on the tachometer shall read from 0 to 3000 RPM. The scale on the air pressure gauges shall read from 0 to 150 pounds per square inch (PSI) with a red line zone indicating critical levels of air pressure. Red indicator lights in the gauge and an audible alarm shall indicate low air pressure.

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

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

RED INDICATORS
Stop Engine - indicates critical engine fault
Air Filter Restricted - indicates excessive engine air intake restriction
Park Brake - indicates parking brake is set
Seat Belt - indicates a seat is occupied and corresponding seat belt remains unfastened
Low Coolant - indicates critically low engine coolant
Cab Tilt Lock - indicates the cab tilt system locks are not engaged.

AMBER INDICATORS
Malfunction Indicator Lamp (MIL) - indicates an engine emission control system fault
Check Engine - indicates engine fault
Check Transmission - indicates transmission fault
Anti-Lock Brake System (ABS) - indicates anti-lock brake system fault
High exhaust system temperature – indicates elevated exhaust temperatures
Water in Fuel - indicates presence of water in fuel filter
Wait to Start - indicates active engine air preheat cycle
Windshield Washer Fluid – indicates washer fluid is low
DPF restriction - indicates a restriction of the diesel particulate filter
Regen Inhibit-indicates regeneration of the DPF has been inhibited by the operator
Range Inhibit - indicates a transmission operation is prevented and requested shift request may not occur.
SRS - indicates a problem in the supplemental restraint system
Check Message - indicates a vehicle status or diagnostic message on the LCD display requiring

	Yes	No

attention.

GREEN INDICATORS
Left and Right turn signal indicators
ATC - indicates low wheel traction for automatic traction control equipped vehicles, also indicates mud/snow mode is active for ATC system
High Idle - indicates engine high idle is active.
Cruise Control - indicates cruise control is enabled
OK to Pump - indicates the pump is engaged and conditions have been met for pump operations
Pump Engaged - indicates the pump transmission is currently in pump gear
Auxiliary Brake - indicates secondary braking device is active

BLUE INDICATORS
High Beam indicator

AUDIBLE ALARMS
Air Filter Restriction
Cab Tilt Lock
Check Engine
Check Transmission
Open Door/Compartment
High Coolant Temperature
High or Low System Voltage
High Transmission Temperature
Low Air Pressure
Low Coolant Level
Low DEF Level
Low Engine Oil Pressure
Low Fuel
Seatbelt Indicator
Stop Engine
Water in Fuel
Extended Left/Right Turn Signal On
ABS System Fault

BACKLIGHTING COLOR

The instrumentation gauges and the switch panel legends shall be backlit using red LED backlighting.

AUXILIARY SPEEDOMETER

The dash shall include an auxiliary speedometer which shall feature a digital readout. Location shall be in front of the officers seat overhead.

RADIO

A Jensen radio with weather band, AM/FM stereo receiver, compact disc (CD) player, and four (4) speakers shall be installed in the cab. The radio shall include rear RCA input pigtail connector, satellite radio capability, and a covered front auxiliary mini stereo input with iPod ready USB jack. The CD player shall be compatible with CD-R, CD-RW and MP3 format discs. The radio shall be installed in the right hand overhead position. The speakers shall be installed inside the cab with two (2) speakers recessed within the headliner of the front of the cab just behind the windshield and two (2) speakers on the upper rear wall of the cab. The receiver shall also have an auxiliary RCA input jack in the center dash panel, and an iLink input cable prewired behind the center panel for an iPod connection and be Blue tooth compatible.

AM/FM ANTENNA

	Yes	No

A small antenna shall be located on the right hand side of the cab roof for AM/FM and weather band reception.

CAMERA

An Audiovox Voyager heavy duty rearview camera system, complete with an LCD display monitor, shall be supplied. One (1) box shaped camera shall be shipped loose for OEM installation in the body to afford a clear view to the rear of the vehicle, one (1) camera with a teardrop shaped chrome plated housing shall be mounted on the drivers side and one (1) on the officers side below the windshield ahead of each front door at approximately the same level as the cab door handles.

The cameras shall be wired to a 7.00 inch flip down monitor which shall include a color display and day and night brightness modes installed above the driver position. The rear camera shall activate when the transmission is placed in reverse, the left and right cameras shall activate with the activation of the respective side turn signal.

The camera system shall include a one- way communication device that shall be an integral part of the rear camera for the use of voice commands directly to the driver.

COMMUNICATION ANTENNA

An antenna base, for use with an NMO type antenna, shall be mounted on the right hand front corner of the cab roof so not to interfere with light bars or other roof mounted equipment installed by the chassis Manufacturer. The antenna base shall be an Antenex model MABVT8 made for either a 0.38 inch or 0.75 inch receiving hole in the antenna and shall include 17.00 foot of RG58 A/U cable with no connector at the radio end of the cable. The antenna base design provides the most corrosion resistance and best power transfer available from a high temper all brass construction and gold plated contact design. The antenna base shall be provided by the chassis Manufacturer.

COMMUNICATION ANTENNA CABLE ROUTING

The antenna cable shall be routed from the antenna base mounted on the roof to the area behind and underneath the right hand front seat.

AUXILIARY COMMUNICATION ANTENNA

An auxiliary antenna base, for use with an NMO type antenna, shall be installed on the cab. The antenna base shall be an Antenex model MABVT8 and shall include 17.00 foot of RG58 A/U cable with no connector at the radio end of the cable. The antenna shall be mounted on the left hand front corner of the cab roof so not to interfere with light bars or other roof mounted equipment installed by the chassis Manufacturer. The antenna base shall be provided by the chassis Manufacturer.

AUXILIARY COMMUNICATION ANTENNA CABLE ROUTING

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

CAB EXTERIOR PROTECTION

The cab face shall have a removable plastic film installed over the painted surfaces to protect the paint finish during transport to the body manufacturer. The rear wall shall also include a removable plastic film installed on the exterior surface of the cab to protect the finish during transport.

FIRE EXTINGUISHER

A 2.50 pound D.O.T approved fire extinguisher with BC rating shall be shipped loose with the cab.

DOOR KEYS

	Yes	No

The cab and chassis shall include a total of four (4) door keys for the manual door locks.

DIAGNOSTIC SOFTWARE OCCUPANT PROTECTION

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

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

- Dearborn Group DPA4 Plus
- Noregon Systems JPRO® DLA+
- Cummins INLINE5
- Cummins INLINE6
- NexIQ™ USB-Link™

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

WARRANTY

Summary of Warranty Terms:

The chassis manufacturer shall provide a limited parts and labor warranty to the original purchaser of the custom built cab and chassis for a period of twenty-four (24) months, or the first 36,000 miles, whichever occurs first. The warranty period shall commence on the date the vehicle is delivered to the first end user.

CHASSIS OPERATION MANUAL

There shall be two (2) digital copies of the chassis operation manual provided with the chassis. The digital data shall include a parts list specific to the chassis model.

ENGINE AND TRANSMISSION OPERATION MANUALS

The following manuals specific to the engine and transmission models ordered will be included with the chassis in the ship loose items:

(2) Hard copies of the Engine Operation and Maintenance manual with CD

(2) Digital copies of the Transmission Operator's manual

(2) Digital copies of the Engine Owner's manual

CAB/CHASSIS AS BUILT WIRING DIAGRAMS

The cab and chassis shall include two (2) digital copies of wiring schematics and option wiring diagrams..

DRIVELINE LAYOUT CONFIRMATION

During the design phase of the chassis the Manufacturers Chassis driveline engineer shall submit the driveline layout to an OEM engineer to review the chassis design for any potential problems integrating the OEM body to the chassis. The OEM engineer shall provide approval to the driveline engineer prior to driveline bills of materials being released.

Yes	No

MODIFICATIONS TO CHASSIS

The following modifications shall be performed on the chassis upon arrival at the body builder's facility:

FUEL FILL

The chassis furnished fuel tank shall be located aft of the rear axle. The body builder shall install the fuel fill on the road side behind the rear axle. The fuel fill will hook up with flexible fuel hose and will have a polished cast aluminum recessed filler with a hinged door. A nametag shall be provided as to the type of fuel the vehicle shall use.

When possible a rear access panel will be provided in rear compartment wall to gain access to the fuel tank sending unit.

APPARATUS INFORMATION LABEL

A label shall be provided in the area of the driver seat to notify the driver of the maximum amount of personnel to be carried on the vehicle as well the overall height, overall length, and the GVWR.

HELMET LABEL

A label stating "DO NOT WEAR HELMET WHILE SEATED" shall be provided and visible from each seating location.

CHASSIS EXHAUST

The chassis exhaust shall be extended just past the body side away from the pump operator. A stainless steel exhaust deflector shall be located just above the exhaust pipe and below the body to prevent discoloration of the body side panels.

REAR TOW EYES

Two (2) heavy duty eyes, .75" x 4" with a 2.375" elongated hole, shall be furnished at the rear of the body under the step and shall be bolted to the truck frame rails. The subframe shall be adequately reinforced to allow the vehicle to be towed (not lifted) from the rear tow eyes.

Provide alternate mounting holes for the rear tow eyes in the drop frame so that they can be located in a forward position, pointing down, and so that they don't interfere with the departure angle

PAINTED TOW EYES - BLACK

Tow eyes will be painted black.

REAR SPRING SHACKLE ACCESS

The rear axle spring shackles, if equipped with grease fittings, shall have the fittings replaced with 90 degree fittings for ease of service once the body is in place.

FLUID ID PLATE

The following quantity and type of fluids used in the vehicle will be listed on a placard and located in the cab:

Engine oil
Engine coolant
Transmission fluid
* Pump transmission lubrication fluid
* Pump primer fluid
Drive axle lubrication fluid

	Yes	No

* Air-conditioning refrigerant
* Air-conditioning lubrication oil
  Power steering fluid
* Cab tilt mechanism fluid
* Transfer case fluid
* Equipment rack fluid
* Air compressor system lubricant
* Generator system lubricant
  Front tire cold pressure
  Rear tire cold pressure
  Maximum tire speed ratings

* = When applicable.

REAR MUDFLAPS

A black hard rubber mudflap shall be installed behind the rear wheels, one (1) each side.

CHROME NUT & HUB COVERS, INSTALL CHASSIS FURNISHED

The chassis furnished chrome hub and nut covers shall be installed on the chassis wheels.

CABINET WITH OPEN STORAGE

One (1) .125" bright aluminum tread plate cabinet will be provided.
One (1) .125" flat aluminum box with a cover will be provided.
Provide an aluminum diamond plate cabinet between the rear facing crew seats. Cabinet to be approximately 28" high by approx. 39 1/2" wide by approx. 18" deep lower & approx. 26" deep to follow the contour of the engine tunnel. This cabinet will be split into two sections. The lower section to have 28" of usable space in height and will have a 1" lip around the opening to the rear that is covered with a 1" mesh secured on all four sides with Velcro. The upper section shall be a 39 1/2"x10"x4" deep box with an aluminum cover with a latch to match currant engine design.
Cabinet shall have one 120 volt receptacle and 12 volt power for flashlight chargers and portable radio in the lower section of the cabinet.

FIXED SHELVES, INTERIOR CABINETS

One (1) adjustable shelve will be fabricated from .188" high strength 5052-H32 aluminum. The shelves are to have a 1" lip on the front edge to retain equipment locate in the lower portion of the cab cabinet.

HELMET HOLDERS

Helmet Holders shall provide and install near each seat position to meet compliance to the 2009 edition of NFPA 1901 for use inside of crew cabs. The holders shall secure traditional and contemporary style helmets without any adjustment being required. Location to be determined by the purchaser!

FIRE PUMP

The pump shall be a Class "A" Midship Hale 1500 GPM Single Stage Model QMAX Centrifugal Fire Pump, U.L. Certified.

The pump shall deliver the percentage of rated capacity at the pressures listed below.

100% of rated capacity at 150 PSI net pump pressure
100% of rated capacity at 165 PSI net pump pressure
70% of rated capacity at 200 PSI net pump pressure
50% of rated capacity at 250 PSI net pump pressure

	Yes	No

When dry, the pump shall be capable of taking suction and discharging water with a lift of 10 feet in not more than 30 seconds through 20 feet of suction hose of the appropriate size.

The engine shall provide sufficient horsepower and RPM to enable pump to meet and exceed its rated performance.

The entire pump, both suction and discharge passages, shall be hydrostatically tested to a pressure of 600 PSI. The pump shall be fully tested at the pump manufacturer's factory to the performance specifications as outlined by the latest NFPA Pamphlet No. 1901. Pump shall be free from objectional pulsation and vibration.

The pump body and related parts shall be of fine grain alloy cast iron, with a minimum tensile strength of 30,000 PSI. All moving parts in contact with water shall be of high quality bronze or stainless steel. Pump utilizing castings made of lower tensile strength cast iron not acceptable. Pump body shall be horizontally split, on a single plane, in two sections, for easy removal of entire impeller assembly including wear rings and bearings from beneath the pump without disturbing piping or the mounting of the pump in chassis.

Pump shaft to be rigidly supported by three bearings for minimum deflection. One high lead bronze sleeve bearing to be located immediately adjacent to the impeller (on side opposite the drive unit). The sleeve bearing is to be lubricated by a force fed, automatic oil lubricated design, pressure balanced to exclude foreign material. The remaining bearings shall be heavy-duty, deep groove ball bearings in the gearbox and they shall be splash lubricated.

PUMP ANODES

Sacrificial anodes will be provided in the pump housing, one (1) for the discharge part of pump and one (1) for the suction part of pump.

PUMP SEAL-MECHANICAL

The pump shall be equipped with self-adjusting, maintenance free MECHANICAL SHAFT SEALS that shall not require manual adjustment. These seals shall be designed in a manner that they will remain functional enough to permit continued use of the pump in the unlikely event of a seal failure.

PUMP IMPELLER

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

Impeller clearance rings shall be bronze, easily renewable without replacing impeller or pump volute body, and of wrap-around double labyrinth design for maximum efficiency.

The pump shaft shall be heat-treated, electric furnace, corrosion resistant, stainless steel, to be super-finished under packing with galvanic corrosion (zinc separators in packing) protection for longer shaft life. Pump shaft must be sealed with double lip oil seat to keep road dirt and water out of drive unit.

There shall be two (2) copies of the pump operation and maintenance manuals provided.

DRIVE UNIT

The drive unit shall be cast and completely manufactured and tested at the pump manufacturer's factory.

Pump drive unit shall be of sufficient size to withstand the full torque of the engine in both road and

	Yes	No

pump operating conditions. The drive unit shall be designed of ample capacity for lubrication reserve and to maintain the proper operating temperature without supplemental cooling.

The gearbox drive shafts shall be of heat treated chrome nickel steel and at least two inches in diameter, on both the input and output drive shafts. They shall withstand the full torque of the engine in both road and pump operating conditions.

All gears, both drive and pump, shall be of highest quality electric furnace chrome nickel steel. Bores shall be ground to size and teeth integrated, crown-shaved and hardened, to give an extremely accurate gear for long life, smooth quiet running and higher load carrying capability. An accurately cut spur design shall be provided to eliminate all possible end thrust.

PUMP SHIFT INDICATORS

For trucks with automatic transmissions, three (3) green indicator lights shall be provided to indicate to the pump operator when the pump has completed the shift from the Road to the Pump position.

Two (2) green lights to be located in the cab. One is to be labeled "Pump Engaged" which illuminates when the pump shift has been successfully completed. The other light is to be labeled "OK to Pump" and is to illuminate when the pump shift has been completed and the transmission is engaged in the proper pumping gear. The labeling and lights shall be included with the pump shift nameplate.

An "OK to Pump" indicator light shall also be furnished on the pump operator's control panel adjacent to the throttle control. A warning label stating "Warning: Do Not Open Throttle Unless Light Is On." shall be installed adjacent to the throttle control.

AIR PUMP SHIFT

The chassis furnished air pump shift, located in the cab, shall be finish plumbed and wired to the pump. Location to match currant engine configuration.

PUMP PRIMING SYSTEM

The pump priming system shall be a Hale model ESP, self lubricating type. The priming pump shall be a positive displacement vane type 12 volt electric driven priming pump, which is to be totally enclosed to prevent dust, dirt and water from entering. It shall be furnished with a hand operated Pull-Release" bronze priming valve which automatically starts the priming pump.

DRIVE LINES

The original drive lines furnished with the chassis shall be reworked to fit the pump installation. The tube, if needed to be lengthened, shall be completely replaced. Splicing of the tube is not acceptable. Tube shall be D.O.M. (Drawn over Mandrel) made for drive shafts.

They shall be electrically MIG welded by a certified welder on a specially designed drive shaft fabrication machine. After welding, the drive shaft shall be checked for straightness and be dynamically balanced by computerized machinery. All drive shafts shall be balanced.

AUXILIARY COOLING SYSTEM

A Sen-Dure model #4373-1-5 supplementary remote heat exchange cooling system of brass and copper construction shall be installed. The unit shall be mounted in the pump compartment and be complete with all proper valving. Controls shall be at the pump operator's panel. Unit shall permit the use of water from the discharge side of the pump for cooling of the coolant circulating through the engine cooling system without intermixing.

The heat exchanger shall have an added tap for a radiator fill if required, elsewhere in these specifications.

	Yes	No

The auxiliary cooler lines shall be routed away from the engine exhaust and be properly secured to the truck frame.

THERMAL RELIEF VALVE

A Hale model TRV120 thermal relief valve shall be furnished on the discharge manifold of the pump. It shall automatically monitor the pump water temperature and relieve water from the pump when the temperature exceeds 120 degrees Fahrenheit. A 3/8" discharge line shall be furnished from the valve and routed to a point below the pump to discharge the water on the ground.

MASTER DRAIN VALVE

Suitable line drains shall be mounted for properly draining all piping lines and pump. The pump shall be equipped with a single master drain valve that includes individually ported drains that do not require check valves. This drain shall also include all relief valves, auxiliary engine cooler, and pump transmission.

DRAIN VALVES - LIFT LEVER

The drain valves shall be ¾" ball brass drain valves with chrome-plated lift lever handles and ergonomic grips. Each lift handle grip shall feature built-in color-coding labels and a verbiage tag identifying each valve. The color labels shall also include valve open and close verbiage.

INTAKE RELIEF VALVE

There shall be a relief/dump valve bolted directly to the suction manifold on the pump. It shall be preset to 125 PSI and be field adjustable behind the curb side pump access door.

There shall be a permanent label affixed near the outlet which states "Intake relief valve outlet - Do not cap."

PUMP PIPING & AKRON VALVES

All discharge valves under 4" shall be Akron brand HD 8800 series. All discharge valves, 4" or larger, when specified shall be Akron 8840 series and shall be equipped with a mechanism to restrict the speed of operating the valve from full closed to full open or vice versa in less than 3 seconds. All threads shall be NST unless specified otherwise.

Discharge and suction piping shall be 100% stainless steel or where more flexibility is required, the discharge and suction lines shall be plumbed with high pressure reinforced flexible hoses which have threaded stainless steel or victaulic fittings. Victaulic couplings shall be used wherever needed to prevent vibration damage and to aid in servicing the pump and related plumbing. **Galvanized piping or fittings will not be accepted (NO EXCEPTIONS).**

MAIN SUCTION INLETS

There shall be a 6" pump manifold inlet with removable, cleanable screen furnished on each side of the body. Each side of the pump is to be provided with a short 4" long suction tube to provide better clearance for externally mounted valves and adapters. The inlets shall be furnished with long handled chrome plated female pressure caps.

MASTER INTAKE VALVE, MANUAL OPERATED LEFT SIDE

One (1) Hale MIV-M manual operated butterfly valve(s) with built in pressure relief valve shall be provided for the main suction inlet(s). Installation shall be on the pump suction manifold behind the pump panel.

	Yes	No

A relief/dump valve will be incorporated into the butterfly valve(s). The valve(s) will be preset to 125 PSI and be field adjustable.

A manual handwheel shall be furnished for the valve(s) located next to the suction tube. A placard will be provided by the control handle indicating control operation. The placard shall have status lights to indicate whether the valve is open, closed or traversing from one position to another.

MASTER INTAKE VALVE, ELECTRIC OPERATED RIGHT SIDE

A Hale MIV-E electric operated butterfly valve with built in pressure relief valve shall be provided for the front suction inlet. Installation shall be on the bottom of the curb side pump suction manifold.

A relief/dump valve shall be incorporated into the butterfly valve. The valve shall be preset to 125 PSI and be field adjustable.

An electric switch located on the operator panel shall be furnished for the valve. A placard shall be provided by the switch indicating control operation. The placard shall have status lights to indicate whether the valve is open, closed or transversing from one position to another. A manual override shall be provided to permit operation of the electric remote control valve in the event of abnormal operating conditions.

5" FRONT SUCTION, GATED

A 5" gated suction inlet shall be located on the right side of the front of the cab. This line shall have victaulic type couplings front and rear with drains located where necessary at the lowest points of the piping.

The inlet shall have a 5" NST male chrome plated adapter with screen and a long handle chrome plated intake cap.

The 5" suction pipe shall be furnished and installed by the chassis manufacturer.

There shall be a class one stainless steel relief/dump valve bolted directly to the front suction pipe. It shall be set to 125 PSI and will be field adjustable from under the truck.

2-1/2" ROAD SIDE AUXILIARY INLET

One (1) auxiliary 2-1/2" NST gated suction inlet shall be provided at the road side pump panel. Valve shall be the 1/4 turn ball type with a lever style control located at the valve. The valve shall be located behind the pump panel.

The auxiliary inlet shall be equipped with a chrome swivel, removable cleanable strainer, male plug and retainer chain. An individual 3/4" bleeder drain with a quarter turn control handle shall be furnished. The drain shall be piped toward the ground.

VALVED INLET LABEL

Any valved inlet located at the pump operator's position shall be provided with a permanent label that states "Warning - serious injury or death could occur if inlet(s) is supplied by a pressurized source when the valve is closed".

2-1/2" MAIN DISCHARGE VALVE, ROAD SIDE

There shall be two (2) 2-1/2" discharge(s) provided at the road side. Discharge valve shall be 1/4 turn, full flow, drop out, self-locking type and shall be mounted behind the pump panel.

The discharge valve shall be gated with easy operating swing valve controls. The outlet shall have a stainless steel NST elbow capped with a chrome plated female cap and chain. Unless otherwise

Yes	No

specified the 2-1/2" valve shall have a 45 degree elbow with a 2-1/2" cap.

The discharge shall have an individual bleeder drain which shall be piped toward the ground.

2-1/2" MAIN DISCHARGE VALVE, CURB SIDE

There shall be one (1) 2-1/2" discharge(s) provided at the curb side. Discharge valve shall be 1/4 turn, full flow, drop out, self-locking type and shall be mounted behind the pump panel.

The discharge valve shall be gated with easy operating controls. The outlet shall have a stainless steel NST elbow capped with a chrome plated female cap and chain. Unless otherwise specified the 2-1/2" valve shall have a 45 degree elbow with a 2-1/2" cap.

The discharge shall have an individual bleeder drain which shall be piped toward the ground.

3" MAIN DISCHARGE VALVES, CURB SIDE

There shall be one (1) 3" discharge(s) provided at the curb side. Discharge valve shall be 1/4 turn, full flow, drop out, self-locking type and shall be mounted behind the pump panel.

The discharge valve shall be gated with easy operating controls. The outlets shall have a stainless steel NST elbow capped with a chrome plated female cap and chain. Unless otherwise specified the 3" valve shall have a 30 degree elbow with a 3" cap.

The discharge shall have an individual bleeder drain which shall be piped toward the ground.

HOSEWELL PRECONNECT

There shall be one (1) 1-1/2 discharge provided at the curb side lower pump compartment area. The discharge valve shall be a 2", ¼ turn, full flow, drop out and be the self-locking type. It shall be gated with easy operating controls located on the pump panel. The piping will be 2" with the outlet equipped with a 90 degree 1-1/2" male NST chicksan swivel adaptor male NST adaptor. No cap is included unless otherwise specified.

DECK GUN DISCHARGE

There shall be one (1) 3" NPT discharge located above the pump for installation of a deck gun. The discharge valve shall be bronze, 3", 1/4 turn, full flow, drop out, and be of the self-locking type.

The 3" discharge valve shall be gated with easy operating push-pull controls. Valve to be controlled from the pump operator's panel.

An automatic drain shall be provided at the lowest point of the piping and the drain shall be piped toward the ground.

EXTEND-A-GUN ASSEMBLY

One (1) TFT Extend-a-Gun #XG-18 assembly shall be furnished on the deck gun piping. This will allow the pipe to extend upward for maximum deck gun use and recess for the minimum storage height.

The Extend-a-Gun will be wired into the "do not move apparatus when light is on" indicator light in cab. The light will be activated when the deck gun is not fully nested.

3" REAR DISCHARGE

There shall be two (2) 3" discharge(s) at the rear of the body. The discharge valve shall be a 3", 1/4 turn, full flow, drop out and be the self-locking type. It shall be gated with easy operating controls located on the pump operator's panel. Unless otherwise specified the 3" valve shall have a 30 degree

	Yes	No

elbow with a 3" cap.

The 3" discharge shall have an individual bleeder drain with a quarter turn control handle. The drain shall be piped toward the ground.

PLUMB 3" HOSE AND PIPE FROM VALVE FLANGE TO REAR OF BODY. TERMINATE WITH 3" NST MALE ADAPTER WITH 3" NST F X 2.5" NST ELBOW ADAPTER WITH CHROME CAP

1-1/2" FRONT PRECONNECT

There shall be one (1) 1-1/2" pre-connect located at the front bumper roadside. The discharge valve shall be a 2", 1/4 turn, full flow, drop out and be the self-locking type. It shall be gated with easy operating controls located on the pump operator's panel. The piping will be 2" with the outlet equipped with a male chrome plated 1-1/2" NST 90 degree swivel elbow located on top of the bumper extension.

The discharge shall have an individual bleeder drain that shall be piped toward the ground.

THREADS TO BE NPSH

CROSSLAYS

Two (2) 1-1/2" crosslay(s) shall be mounted above the pump. Each shall have the capacity of 200 ft. of 1-3/4" double jacket fire hose. Each crosslay shall be individually plumbed with a 2", 1/4 turn full flow drop out valve, 2" piping, and a 90 degree 1-1/2" male NST chicksan swivel adapter. Controls shall be located on the pump panel.

The crosslay compartment floor shall be fitted with aluminum flooring to allow for proper ventilation and drainage. To reduce maintenance and paint chips, the divider and crosslay sidewalls shall have an unpainted oscillated aluminum finish.

The crosslays shall have an individual bleeder drain with a quarter turn control handle. The drain shall be piped toward the ground.

If more than one (1) crosslay is provided a divider shall separate the hose loads.

THREADS TO BE NPSH

CROSSLAY DIVIDER

One (1) removable crosslay divider(s) shall be provided.

CROSSLAY COVER

There shall be a heavy duty .125" bright aluminum treadplate cover over the crosslays which is to be hinged at the front. There shall be two (2) spring-loaded trigger latch devices to secure the cover in the closed position. When necessary, the cover shall also be provided with a stop to prevent it from hitting the cab.

MESH COVERS FOR CROSSLAY ENDS

Black open mesh nylon, 1" web with 1" squares will be provided on each end of the crosslay. The mesh will be fastened so it can be detached and flipped to the side for quick deployment.

REDUCER

At the location(s) noted, two (2) 3" discharge outlet(s) shall be furnished with a South Park model A-37, 3" NST x 2-1/2" NST chrome plated reducer with a 2-1/2" cap in place of the 3" cap.

	Yes	No

Install on both 3" rear discharges.

ADAPTER

At the location(s) noted, one (1) 3" discharge outlet(s) shall be furnished with a 3" NST swivel rocker lug female x 4" Storz discharge adapter and a 4" Storz blind cap in place of the 3" elbow and cap. The final termination shall be at a 30 degree angle.

INSTALL ON THE 3" CURBSIDE DISCHARGE

BOOSTER REEL

One (1) Hannay booster reel(s) shall be located over the pump in the recessed dunnage area. The reel shall have an all-aluminum frame and drum with polished aluminum discs. It shall also have plated drive chain, sprocket, hub assembly, swivel joint and fastenings. The reel shall have 100 ft. of 1" hose. Reel to have a 12 volt motor driven rewind with a guarded finger type push button switch, no higher than 72" from the ground. A label will be provided next to the rewind switch that states the reel type. A 50 amp circuit breaker shall be provided to prevent motor overload. A manual vertical rewind with removable crank handle shall also be provided.

Reel shall be fed through a 1/4 turn, full flow, drop out, self-locking type valve and 2" full flow wire reinforced high pressure hose. A stainless steel guide roller with vertical spools on each end shall be furnished to aid in deployment of the hose.

FOAMPRO MODEL 2002

The apparatus shall be equipped with an electronic, fully automatic, variable speed, direct injection, discharge side foam proportioning system. The system shall be capable of handling Class A foam concentrates. The installation shall create no in-line flow restrictions and shall provide for continuous foam injection even during refill of the foam tanks. The foam proportioning operation shall be based on direct measurement of water flows, and remain consistent within the specified flows and pressures. The system shall be equipped with a digital electronic control display, suitable for installation on the pump panel. Incorporated within the control display shall be a microprocessor that receives input from the system flowmeter(s), while also monitoring foam concentrate pump output, comparing values to ensure that the operator preset is injected into the discharge side of the fire pump.

A flowmeter shall be installed in the discharges specified to be foam capable. The gauge will display either pressure or flow by pushing a button located on the gauge housing. The gauge will be weatherproof and will have a super-bright digital read out. If more than one discharge is to be charged with foam, a manifold shall be provided which will supply the required discharges.

The digital computer control display shall enable the pump operator to perform the following control and operation functions for the foam proportioning system:

a) Provide push-button control of foam proportioning rates from 0.1% to 3.0% in 0.1% increments.
b) Show current flow-per-minute of water.
c) Show total volume of water discharged during are after foam operations and completed.
d) Show total amount of foam concentrate consumed.
e) Simulate flow rates for manual operation.
f) Perform setup and diagnostic functions for the computer control microprocessor.
g) Flash a "low concentrate" warning when the foam concentrate tank(s) runs low.
h) Flash a "no concentrate" warning and shut the foam concentrate pump off, preventing damage to the pump, should the foam tank(s) empty.

The system capacity will be as follows:

Foam Concentrate	Water Flow (gpm)

Yes	No

0.1%	5,000
0.2%	2,500
0.5%	1,000
1.0%	500
3.0%	166

A 12 volt electric motor driven positive displacement foam concentrate pump, rated up to 5.0 gpm (18.9 L/min.), with operating pressures up to 400 psi (28 bar), shall be installed in an exterior compartment near the apparatus pump area. A pump motor electronic driver (mounted to the base of the pump) shall receive signals from the computer control display, and power the 1/2 hp (0.40 kw) electric motor directly coupled to the concentrate pump. The pump is a variable speed duty cycle to ensure that the correct proportion of concentrate preset by the pump operator is injected into the water stream.

Full flow check valves shall be provided to prevent foam contamination of the fire pump and water tank or water contamination of foam tank.

Components of the complete proportioning system as described above shall include:

a) Operator control and display.
b) Class 1 flowmeter(s).
c) Pump and electric motor/motor driver.
d) Wiring harness.
e) Low level tank switch.
f) MultiFlo electronic module (if more than one flowmeter is used).
g) Foam injection check valve.

The system must be installed and calibrated prior to delivery.

The following discharges shall be provided with foam:

The following discharges to be foam capable: 2.5" rear curbside discharge, 1.5" front discharge, booster reel, and both crosslays

FOAM SYSTEM CERTIFICATION

The manufacturer shall certify the following:
1. - The foam system, as installed, complies with the foam equipment manufacturer's installation recommendations.
2. - The foam system has been calibrated and tested to meet the foam equipment manufacturer's and the purchaser's performance specifications.
3. - The accuracy of the foam proportioning system meets the requirements of NFPA, section 20.11.1.

Upon delivery of the fire appartus, documentation shall be provided declaring the foam proportioning sytem, as installed, meets the requirements of NFPA sections 20.10.2 or 20.10.3 across the foam proportioning system manufacturer's declared range of waterflow, water pressure, foam percentage (or foam proportioning system capacity) , and concentrate viscosity at the test points defined in Table 20.11.1.

TANK TO PUMP LINE

The piping from the tank to pump shall be one (1) 3" line and shall deliver not less than 500 GPM. Valve to be 3" 1/4 turn ball type with control at the pump operator's control panel. A flexible line shall be used between the tank sump and the tank to pump valve. A 3" check valve shall be included in the tank to pump line.

TANK FILL LINE

Pump to tank line shall be 2". Valve to be 2" 1/4 turn ball type with a control at the pump operators

	Yes	No

panel. This line is to be hooked to the tank with a flexible hose as not to put any undue strain on the piping or tank.

PUMP COMPARTMENT

The pump compartment is to be made of all aluminum. The compartment shall be supported by aluminum extrusions; 3" x 2" at the front and 2" x 2" at the rear. Both extrusions will have a .25 wall thickness 6061-6 aluminum extruded rectangular tubing that have an integral support built in for the side panels and running boards.

The pump compartment shall be a completely separate module. A minimum of a 1" space shall be provided between the chassis cab and the pump compartment and between the pump compartment and the main body. Spacing is to allow for chassis flexing when driving over uneven terrain.

There shall be a bright aluminum diamond plate top hinged door with two (2) chrome plated lift and turn latch on the curb side for fast and clear access to the pump for service and inspection.

The pump compartment shall be mounted on breaker strips to separate the chassis frame from the aluminum pump compartment.

Any available area above the pump shall be an open storage compartment. It shall have a bright aluminum diamond plate floor in removable sections for access to the pump. The interior side walls and floor shall have an unpainted oscillated aluminum finish.
46" - 49" Side Mount Pump Compartment

PUMP PANELS

Road side and curb side pump panels shall be constructed of 12 gauge brushed stainless steel. The pump panels shall also be removable and held in place with stainless steel fasteners. All pump controls shall be located on the road side panel except for the curb side auxiliary suction inlet if so equipped.

Suction and discharge openings shall be trimmed with color coded collars.

The drain handles will be installed in a separate panel to allow for easy maintenance.

Pump panel shall be the same configuration as our current engine.

PUMP GAUGE PANEL

The pump gauge panel shall be constructed of 12 gauge brushed stainless steel and be located above the road side pump panel. It shall be hinged at the side to swing open for ease of service and inspection. It shall be full width of the pump panel and have two (2) chrome plated lift and turn latches.

PUMP PANEL DRAWINGS

A pump panel CAD drawing showing the proposed locations of the switches, valve controls, gauges, etc. shall be submitted to the Fire Department prior to the fabrication of these panels. This will allow the Fire Department to make minor location requests prior to the fabrication of these panels (no plumbing changes allowed).

RUNNING BOARDS

The running boards shall be constructed of .188" serrated bright aluminum treadplate. They shall be reinforced with a 2" downward break at the front, rear and outboard edges with an additional 1" minimum return break underneath the front edge for superior strength. The front corner of the runningboard shall be tapered to avoid injuries. For ease of replacement if damaged, the running boards shall be bolted in place. A drain gap shall be provided between the pump compartment and the

	Yes	No

running boards.

There shall be a 4" aluminum treadplate kickplate on the lower edge of each side pump panel, just above the running boards.

The running boards shall be a minimum of 13" deep, (when rubrails are present) to provide adequate clearance for externally mounted valves and appliances and to provide better footing for access to storage areas above the pump.

RUNNING BOARD, GRIP STRUT INSERTS

Aluminum grip-strut inserts shall be recessed into the running board top surface, welded in place, to provide a more slip-resistant footing.

RECESSED HOSE WELL

A recessed aluminum hose well shall be furnished in the curb side running board. The hose well shall be manufactured from .125" aluminum treadplate with 1/4" drain holes in each bottom corner. To reduce maintenance and paint chips, the interior of the hose well shall have an unpainted buffed aluminum finish. The hose well shall be free floating (not welded in) to avoid damage if the vehicle is off road and/or to allow the wells to be removed for easier cleaning.

HOSE WELL STRAPS

Two (2) double loop Velcro straps shall be provided to secure the hose in place.

VALVE CONTROLS

Unless otherwise stated in these specifications, the suction and discharge valves shall be operated by remote controls. Valve control handles shall be chrome plated ergonomic handles with a color coded function label. For each discharge with a gauge the control and gauge shall be in the same bezel for pump operator ease. (NO EXCEPTIONS)

PUMP PANEL LIGHTING, LED

An extruded aluminum shield shall be mounted above the road side gauge panel. The light shields shall be made as large as possible to provide maximum light distribution. Two (2) TecNiq #E10-W000-1 LED lights shall be furnished under the shield. Bulbs which are exposed are unacceptable. The lights shall be switched on at the pump operator's control panel.

PUMP PANEL LIGHTING, LED

An extruded aluminum shield shall be mounted above the curb side gauge panel. The light shields shall be made as large as possible to provide maximum light distribution. Three (3) TecNiq #E10-W000-1 LED lights shall be furnished under the shield. Bulbs which are exposed are unacceptable. The lights shall be switched on at the pump operator's control panel.

COLOR CODED IDENTIFICATION PLATES

Each control valve, gauge and discharge outlet shall be labeled with a color coded identification plate. For ease of viewing and quick identification, the plates shall be a minimum of .75" high x 2.5" wide. For standardization, color coding shall be in accordance with the recommendations of Section A.16.9.1 of NFPA 1901.

WARNING LABEL, PUMP OPERATOR

A sign shall be provided on the pump operators panel that states the following:

WARNING: Death or serious injury might occur if proper operating procedures are not followed. The

	Yes	No

pump operator as well as individuals connecting supply or discharge hoses to the apparatus must be familiar with water hydraulics hazards and component limitations.

TOTAL PRESSURE GOVERNOR

The apparatus shall be equipped with a Class1 “Total Pressure Governor” (TPG) that is connected to the Electronic Control Module (ECM) mounted on the engine. The “TPG” shall operate as a pressure sensor (regulating) governor (PSG) utilizing the engine’s J1939 data for optimal resolution and response when supported by the engine manufacturer. If J-1939 engine control is not supported, then analog remote throttle control shall be provided by the TPG. The "TPG" is to operate as a pressure sensor (regulating) governor (PSG) eliminating any need for relief valve on the discharge side of the pump.

The TPG shall utilize control algorithms that minimize pressure spikes during low or erratic water supply situations. The TPG shall be backwards compatible to any engine that supplies J1939 RPM, Temperature and Oil Pressure information providing the ability to maintain a consistent fleet fire-fighting capability and reduce operator cross training and confusion.

The TPG shall have the ability to use either a 300 PSI or a 600 PSI transducer for best operation. PSG system diagnostics shall be built in and accessible by technicians. Programmable presets for RPM and Pressure settings shall be easily configurable.

The “TPG” shall also include indication of engine RPM, system voltage, engine oil pressure and engine temperature with audible alarm output for all. The “TPG” uses the J1939 data bus for engine information, requiring no additional sensors to be installed. The TPG shall use J1939 broadcast warnings for the alarm as a standard and allow the “user” to select warning values if “SOP’s” dictate.

The pump engaged and “OK to pump” indicator lights shall also be displayed on the "TPG".

PUMP OPERATOR'S CONTROL PANEL

All controls will be mounted so they do not exceed 72" from the operating stand and gauges will be mounted so they do not exceed 84" from the operating stand.

MASTER GAUGE ASSEMBLY

There shall be One (1) 6" white faced master pressure gauge, liquid filled, 0-400 PSI and one (1) 6" faced master vacuum gauge, liquid filled, -30-0-400 PSI along with test ports provided.

DISCHARGE GAUGE AND CONTROL ROD

One (1) 2.5" white faced, brass cased individual pressure gauge, liquid filled, 0-400 PSI for each discharge. Each gauge shall have a color coded bezel with the control rod incorporated into the bezel assembly.

SWITCH CONTROL

There shall be on/off rocker switch(es) with shielded hood provided on the gauge panel for switching controls.

AIR HORN SWITCH

An additional push button switch will be installed on the pump panel which will activate the air horns in the case of an emergency. The switch shall include a chrome plated bezel with red label that reads "Evacuation Horn Sound 3X".

PUMP TEST ADAPTER

	Yes	No

A pump test gauge adapter will be provided on the pump panel.

ACCEPTANCE PLATE

A third party acceptance plate will be provided on the pump panel.

PUMP IDENTIFICATION

One (1) pump identification nameplate shall be provided on the pump panel.

WATER LEVEL INDICATOR

One (1) Innovative Controls 14 LED light water level indicator shall be provided on the pump operator's gauge panel.

FOAM LEVEL INDICATOR

One (1) Innovative Controls 14 LED light foam level indicator shall be provided on the pump operator's gauge panel.

REMOTE WATER LEVEL LIGHTS

A remote driver will be provided with the water level system to provide power to 3 Whelen PSTANK LED lights. There will be 2 chassis furnished lights mounted in the side of the cab, 1 each side, and one MBW furnished light at the rear of the body with the light colors from top to bottom, green,blue, amber, red. Lights will be wired so they only operate when the parking brake is set. The chassis furnished tank indicators installation shall be completed and finish wired to the tank level sensor.

BOOSTER TANK

The tank shall have a capacity of 750 U.S. Gallons.

The booster tank shall be constructed of .50" to 1" thick PT3™ polypropylene, a non-corrosive stress relieved thermo-plastic and UV stabilized material, black in color. The booster and/or foam tank shall be designed to be completely independent of the body and compartments. All joints and seams are to be nitrogen fused for strength and integrity. The tank construction shall include PolyProSeal™ technology wherein a sealant shall be installed between the plastic components prior to being fusion welded.

The top of the booster tank is fitted with removable lifting assembly designed to facilitate tank removal. The transverse and longitudinal swash partitions shall be manufactured of a minimum of 3/8" PT3™ polypropylene. All partitions shall be equipped with vent and air holes to permit movement of air and water between compartments. The partitions shall be designed to provide maximum water flow. All swash partitions interlock with one another and are completely fused to each other as well as to the walls of the tank. All partitions and spacing shall comply with NFPA 1901. The walls shall be welded to the floor of the tank providing maximum strength as part of the tank's unique Full Floor Design™. Tolerances in design allow for a maximum variation of 1/8" on all dimensions.

The tank shall have a combination vent and manual fill tower. The fill tower shall be constructed of 1/2" PT3™ polypropylene and shall be a minimum dimension of 8" x 8" outer perimeter. The fill tower shall be blue in color indicating that it is a water-only fill tower. The tower shall be located in the left front corner of the tank unless otherwise specified by the tank manufacturer to the purchaser. The tower shall have a 1/4" thick removable polypropylene screen and a PT3™ polypropylene hinged cover. The capacity of the tank shall be engraved on the top of the fill tower lid. Inside the fill tower there shall be a combination vent/overflow pipe. The vent overflow shall be a minimum of schedule 40 polypropylene pipe with a minimum I.D. of 4" that is designed to run through the tank, and shall be piped to discharge water behind the rear wheels as required in NFPA 1901 so as to not interfere with rear tire traction. The tank cover shall be constructed of 1/2" thick PT3™ polypropylene and UV stabilized, to incorporate a multi-piece

	Yes	No

locking design, which allows for individual removal and inspection if necessary. The tank cover(s) shall be flush or recessed 3/8" from the top of the tank and shall be fused to the tank walls and longitudinal partitions for maximum integrity. Each one of the covers shall have hold downs consisting of 2" minimum polypropylene dowels spaced a maximum of 40" apart. These dowels shall extend through the covers and will assist in keeping the covers rigid under fast filling conditions. A minimum of two lifting dowels shall accommodate the necessary lifting hardware.

The sump shall be constructed of a minimum of 1/2" PT3™ polypropylene and be located in the left front quarter of the tank, unless specified otherwise. There shall be a 3" schedule 40 polypropylene pipe installed that will incorporate a dip tube from the front of the tank to the sump location. An anti-swirl plate will be mounted inside the sump approximately 3" above the inside floor. The sump shall have a minimum 3" N.P.T. threaded outlet on the bottom for a drain plug per NFPA.

TANK OVERFLOW

The vent overflow shall be a schedule 40 polypropylene pipe with a minimum I.D. of 4" that is designed to run through the tank and piped to discharge behind the rear wheels.

BOOSTER TANK WARRANTY

The tank shall carry "**THE ALL OUT NO FAULT LIFETIME WARRANTY**" which is to be provided by the tank manufacturer.

TANK MOUNTING

The booster tank will rest on body crossmembers that are spaced to allow no more than 530 square inches of unsupported area under the tank if the tank height is 40" or less. Where the overall height of the tank exceeds 40", crossmember spacing must be reduced to allow for not more than 400 square inches of unsupported area. In addition, the tank must be isolated from crossmembers through the use of hard rubber strips with a minimum .25" thickness x 1.50" width and a minimum of 60 durometer hardness. The rubber will be a channel shape extrusion so it interlocks over the crossmembers to prevent movement **(NO EXCEPTIONS)**.

The tank will sit cradle-mounted using four (4) corner angles approximately 4" x 4" x 6" high x .25" welded to the body crossmembers. The angles will keep the tank from shifting left to right or front to rear. The tank design is based on a free floating suspension principal. To minimize the movement of an empty tank during vehicle operation, the hosebed slats and dividers will act as a retainer and be fastened front and rear. The tank shall be completely removable without disturbing or dismantling the apparatus body structure.

FOAM TANK

There shall be a Class A foam tank built into the booster tank with a capacity of 40 U.S. Gallons of foam concentrate.

The foam tank shall have a separate fill tower constructed of 1/2" PT3™ polypropylene and shall be a minimum dimension of 8" x 8" outer perimeter. Each foam fill tower shall be constructed of a colored material (green for Class A foam, yellow for Class B foam and black for other foams) indicating which tower is to receive each type of foam utilized. The capacity of the tank shall be engraved on the top of the fill tower lid.

The tower shall be located in the right front corner of the tank unless otherwise specified. The tower shall have a 1/4" thick removable polypropylene screen and a cover with a stainless steel hinge. Inside the fill tower, approximately 1.5" down from the top, there shall be an anti-foam fill tube that extends down to the bottom of the tank.

The foam tank shall be furnished with a pressure/vacuum vent that allows the tank to adjust automatically for changes in pressure or vacuum when filling or withdrawing foam concentrate from the

	Yes	No

tank. The vent shall not permit outside air to enter the tank freely except during operation or for normal changes in volume due to changes in temperature. The vent shall be installed in the lid of the fill tower.

A label shall be placed at or near any foam concentrate tank fill opening that specifies the type of foam concentrate the system is designed to use, any restrictions on the type of foam concentrate that can be used with the system, and a warning message that reads “Warning: Do Not Mix Brands and Types of Foam.”

HOSE BED

The inside body width between panels shall be seventy (70") inches.

The capacity of the hose bed shall meet all requirements set by the N.F.P.A. Pamphlet No. 1901. There shall be a minimum of 55 cu. ft. of storage space.

The interior shall be free of any projections or sharp edges that might damage fire hose or other equipment.

The floor of the hose bed shall be .125” aluminum formed decking with ventilation and drainage holes. The entire bed shall be easily removable from the body. The floor shall allow ample air circulation between the top of the tank, and the underside of the hose bed floor.

To reduce maintenance and eliminate paint chips, the sides of the hose body that are above the hose bed floor shall have an unpainted oscillated finish and a polished stainless steel scuff strip shall be provided at the rear of the hose bed.

HOSE LOAD

The hosebed will be sized to accommodate the following hose load:

300' of 2.5" hose left side, 1000' 5" in the middle, 300' 3" right side and 300' of 1.75" dead storage

HOSE BED DIVIDER(S)

Five (5) adjustable hose bed divider(s) shall be provided to separate the different hose loads. To reduce maintenance and eliminate paint chips all hose bed dividers shall have an unpainted buffed aluminum finish. The divider(s) shall be constructed of .18" smooth aluminum with a round radius corner at the rear. The bottom of each divider shall be welded to a heavy duty, full length slotted extrusion for extra divider rigidity.

HAND HOLE CUT-OUTS

The hose bed dividers will have hand hold cut-out in the rear edge. This hole will be sized so a gloved hand can fit into easily.

HOSE BED, HEAVY DUTY - .125" ALUMINUM DIAMOND PLATE COVER

The main hose bed of the apparatus shall be equipped with a hose bed cover constructed from .125" bright aluminum treadplate, which meets the NFPA slip resistance requirements. The cover shall have a permanently installed divider to support the cover. Construction will be in two (2) equal pieces with a 12" grab rail at the rear of each half. There shall be a small cover at the front for access to the fill tower without opening the main cover. The cover will be wired to the door ajar circuit to indicate if the cover is not closed.

The permanently installed divider shall have built in drain trough, and the cover will have vinyl tarps installed at rear. This cover shall be reinforced so that it will easily hold a mans weight.

A vinyl flap shall extend over the rear of the hose bed. Rear edge of the cover shall be weighted to

	Yes	No

prevent wind damage and also include a positive hold down device to secure hose load.

MESH COVER, HOSE BED END

Black open mesh nylon, 1" web with 1" squares will be provided on the rear of the hose bed. The mesh will be fastened so it can be detached on the bottom and flipped up for quick deployment of hose. The top will be fastened so the entire mesh can be removed during repacking of the hose.

BODY CONSTRUCTION

All body framing, doors, skin, etc. shall be of all aluminum construction to enhance vehicle performance, reduce overall maintenance and maximize available payload by minimizing the body weight. For maximum strength, the body framing shall be all extruded construction.

The body shall be modular in construction, completely separate from the pump compartment, so it may easily be removable from the apparatus chassis without disturbing the fire pump. A minimum of a 1" space shall be provided between the pump compartment and the body module. Spacing is to allow for chassis flexing when driving over uneven terrain to avoid potential stress cracking.

CROSSMEMBERS

There shall be a minimum of three (3) body structural crossmembers of 3" x 2" x .25" wall thickness, 6061-T6 aluminum extruded rectangular tubing.

To eliminate corrosion, all crossmembers and structural tubing will have the ends capped and solidly welded shut on all sides to eliminate the possibility of dirt, water, and salt from entering (NO EXCEPTIONS).

UPRIGHTS

There shall be 3" x 2" x .125" wall thickness, 6061-T6 aluminum extruded rectangular tubing between the exterior side compartments. These shall be tied into the main crossmembers to give the side sheets and any equipment mounted on them adequate support.

ROOF COVE AND CORNER POSTS

For body strength, the corner posts and roof cove perimeter shall have a 1.5" radius of 6061-T6 extruded .125" aluminum. All corners shall have a 1.5" radius cast aluminum ball cap at the top corners of the body.

RUBRAILS, REMOVABLE EXTRUDED CHANNEL

Rubrails will be heavy duty extruded aluminum C-channel design with a bright dipped anodized finish. The top edge of the rubrail will include a ribbed design to help hide scratches and the inside of the channel will be striped with 3M diamond grade red-white reflective tape for improved safety. The rubrails shall have a .25" drain gap and will be located under each compartment door flush with the rear step and pump compartment running boards. These shall be fastened to the threshold extrusion on for ease of service and replacement in case of damage.

BODY GUARDS

The left and right body side compartment front panels shall be bright aluminum treadplate.

FENDERS

Fenders are to be sized to allow ample clearance for tire chains. The fender liners shall extend full depth to the rear springs and be welded to the rear body panels. The fender liners are to be sealed with continuous welds to the outside and inside body panels to provide maximum strength, elimination

	Yes	No

of any pockets for the accumulation of dirt and road salt, and to provide ease of cleaning.

FENDERETTES

The fenderettes shall be polished stainless steel held in place to the wheel housing with stainless steel cap screws and well-nuts for easy replacement. The fenderettes and the fasteners shall be isolated from the wheel housing to prevent electrolysis. A trim molding shall be provided between the fenderettes and wheel housing. The fenderettes shall be mounted to the body thereby affording superior protection from debris hitting the sides of the body.

FENDER PANELS

The body panels above the wheel housing shall be .10" bright aluminum treadplate overlay fastened with stainless steel torx head screws for ease of replacement in case of an accident.

HOSE BODY SIDES

The hose body sides shall be reinforced with 2" x 3" x .125" 6061-T6 extruded aluminum rectangular vertical supports welded to the outside of the panels for support of ladders and equipment and shall be tied into the main crossmembers for support.

The hose bed walls shall be capped with 2” x 2” x .125” aluminum tubing and wrapped on both sides with .125” aluminum to increase the panel strength and provide for a smooth hose body.

BODY MOUNTS - NYLON

There shall be 75,000-90,000 PSI yield high strength .625" bolts to attach the body brackets to the chassis frame, mounted so as to prevent any movement of the body.

Full length nylon sills shall be located between the chassis frame rails and the body.

COMPARTMENT VENTS

Vents shall be provided in each compartment and so located that water cannot normally enter the compartment through the openings. Vents shall be fabricated integrally into the wall of the compartment. Each compartment shall have sufficient vents to provide good air circulation to dry out compartment interiors and equipment.

EXTERIOR COMPARTMENTS

All general framing to be aluminum. Compartments shall be an integral part of the body construction and shall also be suspended by the floor crossmembers. The floor crossmembers shall be attached to the main body uprights located between the compartment openings.

COMPARTMENT FLOORS

Compartment floors will be 100% welded to the threshold extrusion. Floor material to be .125" smooth aluminum and to be of integral support to the front, rear and side compartment walls.

The center portion of the floor will be reinforced with an extruded aluminum channel to prevent buckling and oil-canning. To eliminate corrosion the channels will be inverted to eliminate the possibility of dirt, water, and salt from entering **(NO EXCEPTIONS)**.

DOOR THRESHOLD

The door threshold shall be constructed from a sealed box type 6061-T6 aluminum extrusion. The extrusion shall be tied into the extruded uprights and shall provide a flush "sweep-out" style floor with no lip. The extrusion shall run under the compartment floor to prevent damage when heavy equipment is dropped on the front lip of the floor. A formed up compartment floor providing the sweep out lip area

	Yes	No

shall not be acceptable.

MATEFLEX GRATING

Black Mateflex grating shall be installed where specified. Where appropriate the grating shall have a beveled edge facing the front of the compartment to prevent snagging while loading equipment.

Provide Mateflex on all body compartment floors, shelves, and Trays

COMPARTMENT WALLS

The compartment sidewalls and rear wall to be .125" smooth aluminum. All compartment seams will be 100% sealed so to provide a water tight compartment.

The side compartment walls will be double wall design so all wiring can be hidden and also allow outlets, switches, reel buttons, breaker boxes, etc. to be recessed into the walls. **Separating the compartments with a single shared wall will not be acceptable. (NO EXCEPTIONS)**

ROLL-UP COMPARTMENT DOORS

The body side compartments shall be equipped with AMDOR brand roll up doors.

The doors shall be constructed of double wall slats that provide a smooth surface on the interior of the door to prevent interference with compartment contents. The slats shall have recessed bulb type slat seals which provide a weatherproof compartment and reduce the effects of vehicle vibration. The aluminum extrusions shall be equipped with nylon universal end shoes with positive snap-in securement's that slide in the track and side frame section. The top frame section shall include a gutter, non-marring top seal and bumper to cushion the bottom rail.

The latching mechanism will be a lift bar arrangement, which utilizes a door-wide spring loaded bar and two (2) cam-surfaced latch points. Any roll door that exceeds a 63" high door opening from the rubrail or above 30" if over a wheel well shall include a pull down strap to make for easy closing.

ROLL-UP COMPARTMENT DOOR

The rear compartment shall be equipped with AMDOR brand roll up door.

The door shall be constructed of double wall slats that provide a smooth surface on the interior of the door to prevent interference with compartment contents. The slats shall have recessed bulb type slat seals which provide a weatherproof compartment and reduce the effects of vehicle vibration. The aluminum extrusions shall be equipped with nylon universal end shoes with positive snap-in securement's that slide in the track and side frame section. The top frame section shall include a gutter, non-marring top seal and bumper to cushion the bottom rail.

The latching mechanism shall be a lift bar arrangement, which utilizes a door-wide spring loaded bar and two (2) cam-surfaced latch points. Any roll door that exceeds a 63" high door opening from the rubrail or above 30" if over a wheel well shall include a pull down strap to make for easy closing.

DOOR FINISH

The rear compartment roll up door shall have a natural anodized finish.

DOOR FINISH

The body side compartment roll up doors shall be painted by the door manufacturer with a WET paint type coating. The Body Manufacturer shall supply the paint to ensure proper color match. The drip rail and outside tracks shall be left in natural anodized finish.

	Yes	No

DRIP PANS

The exterior compartment doors shall have a drip pan provided under the shutter to protect the door and to eliminate water from the doors entering the compartment when rolled up. The pans shall have tubes to run the water in between the compartment walls and exit underneath the apparatus. The pans shall be spring loaded for easy removal in the even the door must be serviced.

Locate in R1, R2, R3 ,C1, C2, C3

BUMPER STEP

The rear bumper step shall be 12" deep and full width. The outside corners will be a 45 degree chamfer to avoid injuries. A space shall be maintained between the body and the step. The step shall be supported by formed angles welded directly to the body.

The step will be fabricated from .188" serrated bright aluminum tread plate.

There shall be a warning label mounted above the rear step.

"DANGER - DO NOT RIDE ON REAR STEP WHILE VEHICLE IS IN MOTION. DEATH OR SERIOUS INJURY MAY RESULT."

STEP, FOLDING, CHROME PLATED

Nine (9) heavy duty Cast Products #SP4401-1CH-BL chrome plated folding step(s) with a slip resistant surface, shall be provided in the location specified. The step(s) shall include a built-in LED light, located above and below the stepping surface, to provide better visibility.

Total of 9 folding steps. Locate 3 on the front roadside body and 3 each side on the rear of the body.

12" ACCESS RAIL

Access rails(s) shall be 1.25" diameter extruded aluminum tubing in chrome plated stanchions.

Five (5) 12" access rail(s) shall be mounted in the location(s) specified.

Locate 1 rail on the roadside of the pump compartment just below the hose rollers for use with the steps on the front of the body.

Locate 2 rails on the front (one each side) and 2 on the rear (one each side) of the hose bed cover. Rails to be located toward the center of the hose bed

ACCESS RAILS

Access rails shall be 1.25" diameter extruded aluminum tubing in chrome plated stanchions.

There shall be one (1) 48" long access rail mounted on the roadside rear of the body.

ACCESS RAIL, BELOW HOSE BED

One (1) full width hose bed access rail shall be mounted just below the floor of the hose bed.

Access rail below the hosebed to be approximately 60" long

PAINT

The complete apparatus body and any applicable doors shall be painted. All exposed metal surfaces which are not chrome plated or polished shall be thoroughly cleaned and prepared.

	Yes	No

To prevent corrosion and to insure bonding of primer, the body shall be be cleaned and degreased with the paint manufacturer's recommended wax and grease remover. All irregularities in primed surfaces shall be sanded down before application of the finished coats. All removable items such as compartment doors shall be removed and painted separately.

To prevent electrolysis around fasteners, special attention must be given to how components are fastened to the exterior of body. All vendor-supplied screws shall be discarded and the manufacture shall replace them with their own stainless steel screws. In addition, every screw hole possible that protrudes into the body shall be punched with a square hole and then a plastic insert will be installed to isolate the dissimilar metals. Where an insert cannot be used, a zinc-rich type coating will be applied to each screw before they are installed. **(NO EXCEPTION TO THIS REQUIREMENT)**

PPG polyurethane "Delfleet® Evolution" lead free paint shall be used on the body. Consistent with this requirement and to insure optimum adhesion of final paint and long service of paint, all related materials shall be those specified by the paint manufacturer for use with their finish. These related products shall include, but not be limited to the following: PPG Epoxy primer, catalysts, thinners, and hardeners.

The body shall be painted the same color as the chassis.
Paint Body (Pumper) C.S.

PUMP COMPARTMENT PAINT (PAINTED JOB COLOR)

The pump and the framing of the pump compartment module shall be painted the job color. The open bin area and the crosslay above the pump shall remain in a natural finish. The pump and plumbing shall be power washed, degreased and primed prior to painting.

CAB PAINT

The cab and wheel exteriors shall be supplied in the proper color and shall not be repainted. Fire Department to use an available color from the chassis manufacturer.

COMPARTMENT FINISH

To reduce marring and scuffing, the insides of the exterior compartments shall be painted with a durable light gray spatter type coating.

SHELF & TRAY FINISH

Any shelves, trays, etc. shall be left a natural aluminum oscillated finish to allow for easy equipment mounting. The sides and forward face edges of all the roll-out items will include a 3M diamond grade red-white reflective stripe to improve safety.

FINISH PAINT UNDERBODY

The body undercarriage shall be primed and painted to match the color of the body. This shall include the underside of the compartments, rear step, and wheel well liners.

REFLECTIVE MATERIAL

All crew compartment doors shall have a minimum of 96 square inches of reflective material affixed to the inside of each door.

GOLD LEAF LETTERING

Genuine gold leaf lettering shall be furnished on the apparatus. The lettering shall be genuine 23 carat gold leaf and have a burnished (engine turned) finish. Letters to be outlined and drop shaded with

	Yes	No

black enamel paint. The lettering shall also be protected by a coat of clear enamel. up to sixty (60) 3" letters shall be provided. Lettering layout shall be as follows:

SEAL, INSTALL CUSTOMER FURNISHED DECAL

A pair of customer furnished seals will be applied on vehicle. Seals will be located as follows:

for installation of (Wildcat) decals

REFLECTIVE STRIPING

A 1-6-1 horizontal Scotchlite reflective cab and body stripe shall be provided.

Stripe shall break at all unpainted surfaces. Where necessary, the striping material shall be applied to a smooth aluminum plate mechanically fastened to the apparatus.

REFLECTIVE STRIPING CHEVRON

A two color 6" Scotchlite diamond grade reflective V pattern Chevron shall be applied to the rear of the apparatus. The Chevron stripe shall alternate between yellow green with red stripes with overlaminate and shall cover the entire rear painted body surface.

OVERALL LENGTH REQUIREMENT

The overall length of the body should not exceed _32'____".

OVERALL HEIGHT REQUIREMENT

The overall height of the body should not exceed _11’8”____".

OVERALL WIDTH

Overall Width = 96" + rubrails.

COMPARTMENT SIZES

Road Side - front to rear (Nominal door opening size.)

1. 63" high x 42" wide x 25" deep. Clear depth. Roll-up door.

2. 30" high x 57" wide x 25" deep. Clear depth. Roll-up door.

3. 63" high x 42" wide x 25" deep. Clear depth. Roll-up door.

Curb Side - front to rear (Nominal door opening size.)

4. 63" high x 42" wide x 25" deep. Clear depth. Roll-up door.

5. 30" high x 57" wide x 25" deep. Clear depth. Roll-up door.

6. 63" high x 42" wide x 25" deep. Clear depth. Roll-up door.

Note: Compartment depth in Curbside 1 compartment subject to change due to emissions requirements. Compartment width in Curbside 1 & 3 will be narrower around the hydraulic rack components.

Rear Compartment (Nominal door opening size)

	Yes	No

48" high x 42" wide x 21" deep. Clear depth. Roll-up door.

DUALSCBA BOTTLE COMPARTMENT

Four (4) SCBA bottle compartment(s) shall be provided in the rear fender housing area. Compartment shall be constructed from aluminum with the bottle storage having lining to protect scuffing of the SCBA bottles. The compartment shall have a treadplate door and will include black non-locking flush pull latches.

Locate 1 curbside and 1 roadside

VERTICAL DIVIDER (30" MAX DEPTH)

One (1) fixed vertical divider(s) shall be fabricated from .13 smooth aluminum. The divider shall have a 1" lip on all edges for added strength.

Locate in C-1

ADJUSTABLE SHELVES (28" MAX DEPTH)

Ten (10) adjustable shelve(s) shall be provided and fabricated from .188" high strength 5052-H32 aluminum. The shelves are to have a double channel break both front and rear to form a reinforced channel. The rear channel is to be bent in the opposite direction of the front so that the shelf is reversible to provide either a lip to retain equipment or a smooth sweep-out front.

For ease of adjustment and as additional shelving reinforcement, the shelves shall not be bolted directly to the standards but shall be supported by angle shelf holders that in turn are fastened to the standards.

Locate (2) shelves in R-1, (3) in R-3, (2) in C-1 forward of divider, (1 in C-2, And (2) in C-3

SHELVING STANDARDS FOR ADJUSTABLE SHELVES

Six (6) compartments shall be equipped with heavy duty adjustable shelving standards, one per wall on all depths 20" or less and two per wall on depths greater than 20". These standards are to be the infinitely adjustable type of 6061-T6 extruded aluminum, located 2" up from floor and 12" down from ceiling.

Locate in R1, R3, C1, C2, and C3

Provide 2 sets in C1- one for the tool boards and one for the shelves

ROLL-OUT TRAY, 600 LB CAPACITY

One (1) roll out tray(s) shall be provided in the compartments specified. Trays shall be fabricated of .188" smooth 5052 aluminum and have a 3" high lip on all four sides. The tray shall be mounted on Slidemaster 600 lb. capacity, model SM3 slides that extend 100% of the compartment depth. Track will have a powder coating to prevent corrosion and a spring loaded lock to allow the drawer to lock in the open and closed position.

ALUMINUM TOOL BOARDS W/ PEG BOARD HOLES - 300 LB CAP. ROLL OUT

Two (2) tool board(s) shall be furnished. Each board shall be fabricated of .19" smooth aluminum reinforcement bends, and a a hand pull-out. Each board shall be mounted on a 300 lb. capacity Accuride 9301 ball bearing slides with 100% full extension. A gas prop will be provided to hold the board in the open and closed position.

Boards will be left a natural oscillated finish with a peg board design. The entire board will include 1/4"

Yes	No

holes on 1" centers so as to provide easy mounting of tools.

Tool boards shall be located in C1, rear of the divider. Tool board shall have PAC brackets to secure all tools to board.

WIRING DIAGRAMS

Two (2) complete copies of the body electrical wiring diagrams shall be supplied with the unit.

Separate diagrams for the 12 volt DC and 120 volt AC (if applicable) electrical systems shall be provided. Diagrams shall be custom drawn for this specific apparatus. Generic wiring diagrams are not acceptable.

12 VOLT WIRING – CONVENTIONAL HARDWIRED

All of the emergency electrical equipment shall be served by circuits separate and distinct from the vehicle circuits. Body wiring shall be thermo plastic harness type, GXL (125 degree Centigrade) color and/or number or function coded. The wiring shall be grease, oil and moisture resistant, routed in convoluted looms and in protected locations. Wires and looms shall be neatly and securely fastened, and all apertures with proper grommets for passing wiring.

Solderless insulated crimp connectors shall be provided. Wire nut, insulation displacement, and insulation piercing connections shall not be used. All electrical connections that are exposed to the elements shall be of the heat shrink sealant type **(NO EXCEPTIONS)**.

The body electrical shall be designed for controlling the electrical devices of the vehicle. It shall consist of several automotive style relays, circuit breakers, and electrical devices strategically located throughout the vehicle . Microprocessor controlled solid state modules of any kind shall not be utilized **(NO EXCEPTION)**.

Junction areas with removable aluminum covers shall be located inside the road side and curb side front compartments.

The body shall be fabricated so as to provide protected wiring raceways.

ELECTRICAL TESTING

Electrical continuity shall be verified from the chassis or body to all line voltage electrical enclosures, light housings, motor housings, light poles, switch boxes, and receptacle ground connections that are accessible to fire fighters in normal operations as per NFPA section 22.15.4.

CAB CONSOLE PANEL

A console panel shall be provided in the cab at a location that is convenient for use by the driver or officer.

The panel will utilize rocker switches with built in indicator lights. Labeling for switch identification shall be back lighted for night operation and located below the switch for easy identification.

MASTER WARNING LIGHT SWITCH - CHASSIS FURNISHED

A master warning light switch shall be provided on the cab switch console. The switch shall permit preselection of the emergency warning lights so that all warning lights can be turned on simultaneously through the sequencer.

There shall also be an interlock provided with the parking brake to change the visual warning to indicate "BLOCKING RIGHT OF WAY" mode.

	Yes	No

LOAD MANAGER

A Kussmaul model #091-79 load manager will be provided for load management of the electrical system. The D.C. input of the load manager is monitored and when the voltage drops below the set point, a relay is operated. When the voltage drops an additional .5 volts, another relay is energized. The relays have both normally opened and normally closed contacts available for complete flexibility in wiring.

In case of a low voltage situation, the system will shed the selected load until the proper voltage is maintained.

LOW VOLTAGE ALARM - CHASSIS FURNISHED

An audible alarm and visual warning light will be installed in the cab to alert of a low voltage situation. The alarm and light will be activated when the voltage at the batteries or at the master load disconnect switch drops below 11.8 volts for more than 120 seconds.

RUNNING LIGHTS, LED

Body shall be equipped with all lighting and reflectors as required by Federal Motor Vehicle Safety Standards.

Clearance lights shall be LED type.

The license plate light shall be Ri-Tar model #M27 LED license plate light with chrome housing.

MARKER/DIRECTIONAL LIGHTS

Two (2) amber led marker/directional lights shall be provided, one each side, in rear fenderwells.

STOP, TAIL, AND TURN LIGHTS

One (1) rectangular Whelen 600 series LED amber arrow light each side of body for turn signals.

One (1) rectangular Whelen 600 series LED light with red lens each side of body for stop and tail.

BACKUP LIGHTS

One (1) Whelen 600 series maximum intensity LED light shall be provided on each side of body for the backup light, wired to the reverse circuit of the truck transmission.

AMDOR COMPARTMENT LED STRIP LIGHTS

Compartment(s) specified shall have two (2) Amdor LED strip lights provided. The light will include a translucent lens and have lights located every 3".

Locate in R1, R2 R3, C1, C2, C3 and rear compartment.

DOOR AJAR INDICATOR LIGHT - CHASSIS FURNISHED

There shall be a chassis furnished flashing red "do not move apparatus when light is on" indicator light in the cab to indicate that a cab door, entrance door, or compartment door is not in the closed position. Light will only illuminate when the parking brake is not fully engaged.

LIGHT IN PUMP COMPARTMENT

One (1) grommet mounted 4" diameter light shall be provided in the pump compartment. Light to be

Yes	No

switched through the gauge panel light switch. The light shall be spaced so as to provide the best possible lighting within the compartment.

STEP LIGHTS, LED

Step lights shall be wired through the marker light and parking brake circuit with the locations as follows:

Two (2) TecNiq #E03-W000-1 LED surface mounted lights with #E03-0SH0-1 stainless steel horizontal case, one each side on the inside face of the beavertail to illuminate the rear hose bed access step area.

Two (2) TecNiq #E03-W000-1 LED surface mounted lights with #E03-0SH0-1 stainless steel horizontal case at the front of the body, one on the curb side and one on the road side to illuminate the running boards and side pump panel areas.

OPTI-SCENELIGHT SERIES 900 SUPER LED

Six (6) scenelights shall be provided in the location specified and shall be switched in the cab. The lights shall be Whelen 900 Series Super LED, high intensity 90º gradient Opti-Scenelights™ with 24 diodes and chrome plated flange.

Locate 2 on each side of the upper body, one toward the front and one toward the rear

Locate 2 on the upper rear of the body

GROUND LIGHTS

Amdor Luma Bar H2O LED ground lights shall be installed under each stepping surface. Lights shall be mounted under each pump panel running board and rear step. The lights shall be activated through the marker light and parking brake circuit.

GROUND LIGHTS

The lights under the chassis entrance doors that are provided by chassis dealer shall be activated when the doors are opened.

ADDITIONAL LUMA BAR GROUND LIGHTS

Four (4) additional Amdor Luma Bar H2O LED light(s) shall be provided under the vehicle in the area specified. The lights shall be switched together with the other ground lights.

Locate (1) 12" long H2O ground light under R1,R3,C1 & C3

BEACON WHELEN SUPER LED

There shall be Two Whelen NFPA zone C approved model L31HRFN Red LED beacon(s) mounted on the vehicle. The lights shall be switched in the cab.
All lights to match currant engine configuration.

SUPER LED, SERIES 600, RED

Four (4) Whelen series 600 Super LED lights with clear lens and chrome flange will be provided and mounted as follows.

Locate (1) Red Whelen series 600 Super LED light each side in the rear fender area and (1) on the lower rear of the body on the officer side.

	Yes	No

SUPER LED, SERIES 600, Blue

Locate (1) Blue Whelen series 600 Super LED light on the lower rear of the body on the Drivers side.

All lights to match currant engine configuration.

SUPER LED, SERIES 600, AMBER

Four (4) Whelen series 600 Super LED lights with chrome flange will be provided and mounted as follows.

Whelen series 600 Super LED Amber lights Locate (1) each side in the rear fender area and (1) each side of the upper rear of the body below each scene lights
All lights to match currant engine configuration.

120 VOLT WIRING & BREAKER PANEL

All 120 volt wiring shall be metallic or nonmetallic liquid tight flexible conduit rated at not less than 90 degree Centigrade or type SO cord with a WA suffix, rated at 600 volts at not less than 90 degree Centigrade. The cord will be number or function coded to assist in trouble shooting.

All electrical equipment shall be circuit breaker controlled from a circuit breaker control panel. A plastic engraved label will be installed near the breaker box to identify the function of each circuit breaker.

A power source specification label shall be permanently attached near the breaker box. The label shall provide the operator with the following information:

- Rated voltage and type
- Phase
- Rated frequency
- Rated Amperage
- Continuous rated watts
- Power source engine speed

HOT SHIFT PTO

The hydraulic pump shall be driven by the chassis engine VIA a "HOT SHIFT" power take off unit from the chassis transmission. The engagement control to be located in cab, and identified by name plate. A console switch will be provided with a light to indicate “Generator Engaged” and an additional green light will be provided to indicate “OK to Operate Generator”.

6 KW HARRISON HYDRAULIC GENERATOR

A complete Harrison 6 KW hydraulic generator system shall be furnished and installed on the apparatus.

Generator Performance:

Rating: 6,000 watts (6 KW)
Volts: 120/240
Phase: Single
Cycles: 60 Hertz
Amp. rating: 50 at 120 volts
Engine speed at engagement: Idle
Engine speed after engagement: 780 RPM (minimum)

Yes	No

HYDRAULIC DRIVE COMPONENTS

If there is sufficient room, the hydraulic pump will be mounted directly to the PTO. There shall be a triangular brace on the tail of the pump for support and to meet the PTO specifications on weight restriction.

If there is not enough room to direct mount the pump to the PTO then the pump shall be mounted to the frame rails with a drive shaft between them. The drive shaft between the generator and the power take-off shall be a tubular type, minimum outside diameter of 2" with a minimum wall thickness of .083. It shall have Spicer #1280 U-joints and be dynamically balanced to insure vibration free performance. NOTE; Solid bar stock type drive shafting is unacceptable. The drive shaft shall have a slip yoke with a minimum of 1.5" travel so that it can be easily removed. Tube shall be D.O.M. (Drawn over Mandrel) made for drive shafts.

They shall be electrically MIG welded by a certified welder on a specially designed drive shaft fabrication machine. After welding, the drive shaft shall be checked for straightness and dynamically balanced by computerized machinery. All drive shafts shall be balanced. (No exceptions.)

SYSTEM COMPONENTS

System components such as hydraulic hoses, the hydraulic reservoir, hydraulic cooler, etc. shall be furnished and installed in accordance with the manufacturer's recommendations and requirements.

SAFETY FEATURES

The system shall be furnished with a model SA-4 high fluid temperature sensor, a model SA-3 low fluid level sensor, loading valve with time delay relay and an under voltage shunt trip to provide for better system protection in extreme operating conditions.

MANUAL AND SCHEMATICS

Two (2) complete parts lists, maintenance, wiring schematic, hydraulic schematic, circuit boards, voltage regulator board, and other component manuals shall be provided.

CAB MOUNTED CONTROLS

In addition to the instruments and controls at the circuit breaker box location, additional controls shall be located in the chassis cab adjacent to the driver.

The following controls shall be provided in cab:

1. One (1) hydraulic generator engagement control with red pilot light.

2. One (1) engine fast idle switch.

There shall be a warning light in the cab to indicate when the PTO is engaged. An additional green light will be installed in the cab and marked "Generator PTO operational".

GENERATOR CONTROL PANEL

There shall be an generator control panel complete with one (1) voltmeter, two (2) ammeters, one (1) frequency meter, one (1) hour meter, and two (2) single pole circuit breakers. The panel shall be located near the 120/240 current breaker panel.

GENERATOR LOAD TEST

The generator shall be load tested at the body builders facility by a third-party testing firm. The

	Yes	No

generator shall be tested at various loads, from no load to full load to ensure reliable power delivery at various loads. The department shall be given a certificate proving completion of this test. The test shall last for two (2) hour and shall be completed after the generator has been installed on the apparatus.

REMOTE GENERATOR START/STOP SWITCH

An additional generator start/stop switch and preheat switch will be provided in the location specified.

LIGHT TOWER

There shall be one (1) Will-Burt Nightscan Model #NS 6-20 RCP 600 WH telescoping vertical mast(s) installed as specified. The lights to be wired directly to the generator system circuit breaker panel with conduit and standard copper wire.

The pneumatic telescopic light tower shall be piped to the vehicle air system. The lights shall telescope at 20 feet above the mounting surface and rotate 360 degrees.

The light mast shall be internally wired and equipped with four (4) Whelen "Pioneer" #PFP2AC, 150 watt LED floodlights, 120 volt, mounted on Will-Burt's RCP dual tilt Remote Control Positioner lighting system.

Instruction and warning labels shall be provided near the operating position of the light tower. A label shall also be provided that states the extended tower height from the ground and bulb replacement data. The light tower shall be equipped with a proximity switch. The switch will be wired into the "do not move apparatus when light is on" indicator light in cab and a light located in the area of the light tower controls. The lights will be activated when the light tower is not fully nested.

A 12-volt observation light will be installed on light tower. The light will be activated as soon as the up position switch is activated. The light is position so it will shine up in the air to help check for any overhead obstacles.

LIGHT TOWER CONTROL

A wired remote control pistol grip with 25’ of coiled cable shall be provided and installed to control the light tower. The function of the control shall include full rotation and dual tilting lights, mast up/down and automatic stow and deployment of the light tower.

ELECTRIC CORD REEL

There shall be one (1) Hannay #ECR 1600 Series cord reel(s) mounted in the compartment(s) specified. The color of the reel shall be red.

The reel(s) shall be equipped with a 12 volt DC electric rewind motor. A guarded push button switch, no higher than 72" from the ground, shall be located next to the reel to activate the rewind motor. A label will be provided next to the rewind switch that states the reel type.

A label shall be provided in a readily visible location near reel. The label shall indicate:
- Current rating
- Current type
- Phase
- Voltage
- Total cable length

Locate the cord reel in C1 forward of the vertical divider as high as possible

12/3 YELLOW SO CORD

	Yes	No

Two Hundred (200) feet of 12/3 yellow SO cord will be provided and installed as specified.

ELECTRICAL JUNCTION BOX

There shall be a total of one (1) Extenda-Lite model EJB four (4) outlet junction box(es) provided with one attached to the end of the electric cord reel(s) specified. Box to include four (4) backlit outlets with weatherproof snap covers. A mounting bracket shall be furnished on the inside of the compartment door where the cord reel is mounted to hold the connector box.

Outlet configuration will be a NEMA #L5-20R.

Dealer will mount the distribution box

No Hannay Ball Stop Required

OUTSIDE ARM LADDER LOWERING DEVICE

The side of the apparatus shall be provided with a powered ladder lowering device designed to support and secure various ladders, pike poles, and hard sleeves.

Control to be placed on the pump panel (if applicable) or as specified. Positioning of control shall allow for downward motion of the ladder rack by moving the control lever down and upward motion by moving the control up.

The rack is to be mounted using two hydraulic pivot arms to raise and lower the ladders. The arms will be located on the outside of the body on each end.

An audible warning device shall sound when the ladder rack is in motion and an interlock switch shall be provided to prevent the ladder rack from being lowered when the lower body compartment doors are open.

The outward side of the equipment rack that protrudes beyond the body of the apparatus shall be stripped with reflective tape so as to indicate a hazard or obstruction.

The ladder rack will be wired into the "do not move apparatus when light is on" indicator light in cab. The light will be activated when the ladder rack is not fully nested.

ALCO-LITE 10' FOLDING LADDER

One (1) 10' 6" FL-10 Alco-Lite aluminum folding ladder(s) shall be provided.

ALCO-LITE 14' ROOF LADDER

One (1) 14' 9" PRL-14 aluminum roof ladder(s) with folding hooks shall be provided.

ALCO-LITE 24' TWO-SECTION EXTENSION LADDER

One (1) 24 ft. PEL-24 Alco-Lite aluminum two-section extension ladder(s), with ladder locks and rope hoist shall be provided.

HARD SUCTION HOSE RACK

Two (2) hard suction hose brackets shall be furnished on the ladder rack. Each length of hard suction hose shall be mounted on a polished stainless steel troughs. Two (2) double loop velcro straps shall hold each hose in place.

Locate both hard suction hose on the ladder rack

Yes	No

SUCTION HOSE

Two (2) suction hose(s) shall be furnished and will be Maxi-Flex 6" x 10' long type with lightweight couplings on each end. Couplings shall be NST threads with a long handled female on one end and a rocker lug coupling on the male end.

BARREL STRAINER

There shall be one (1) 6" chrome plated barrel type strainer(s), shipped loose.

ship loose

BOOSTER HOSE

One Hundred (100) feet of 1" booster hose shall be furnished. Hose will be red in color with chrome plated brass Bar-Way hole type NST couplings. The working pressure of the hose to be 800 lbs.

MISCELLANEOUS EQUIPMENT

The following equipment items listed shall be furnished by the body builder with the apparatus. All equipment shall be shipped loose unless otherwise specified.

PIKE POLE

One (1) Fire Hook Unlimited 6' NY Roof Hook pike pole(s) with aircraft steel shaft will be provided.

PIKE POLE

One (1) Fire Hook Unlimited 8' NY Roof Hook pike pole(s) with aircraft steel shaft will be provided.

PIKE POLE BRACKETS

Two (2) aluminum tube(s) shall be provided for mounting of the pike poles.

Locate pike poles on ladder rack

NOZZLE

There shall be one (1) Elkhart model SFS 1" Select-O-Flow Nozzle(s) with three gallonage positions, 10-20-30 GPM plus flush. Combination fog and straight stream.

locate on booster hose on reel

TRAFFIC CONES

Five (5) quick deploy 28" spring cones that meet NFPA and MUTCD highway traffic cone requirements shall be provided. The cones are made of durable, bright orange, flexible mesh material. Each cone shall weigh 3 lbs. and be easily stored in the wire mesh tote storage system.

WRENCH

There shall be one (1) South Park # WH76301A wrench holder(s) and wrench set(s) which consists of two USW7501A universal spanner wrenches and one AHW7001X adjustable hydrant wrench.

WHEEL CHOCKS

One (1) set (pair) of Worden Model #HGS non- folding NFPA approved type wheel chocks shall be provided. Wheel chocks will be mounted under the body in Worden underbody tracks.

	Yes	No

FIRECOM HEADSET

There shall be a complete set of Firecom headsets for each riding position in the cab. Officers headset to be direct wired, Drivers headset wireless with transmit and all other seats to wireless w/o transmit.

ISG X380 Vehicle Mounted Charger

There shall be an ISG charger compatible with the ISG X380 Thermal Imager base. Base shall be supplied, wired and mounted on the engine tunnel as specified by the customer.

MISCELLANEOUS FASTENERS

A bag of miscellaneous fasteners that was used on the construction of the apparatus will be provided with the completed unit.

CORROSION PROTECTION

A bottle of ECK corrosion prevention chemical shall be supplied loose with final delivery of the apparatus to ensure the customer will be able to place this on any screws inserted or removed from the body in the future.

NFPA REQUIRED ITEMS

It shall be the purchaser's responsibility to provide all equipment items required by NFPA 1901 that are not otherwise addressed in these specifications. These items shall be installed on the apparatus prior to it being put into active service.

WEBSITE UPDATES

Production photos of the apparatus being built will be provided by the body builder. The photos will be taken every two - three weeks as production allows and posted to a private website designed only for the Fire Department to view. These photos will allow the Department to view the manufacturing process of the truck and possibly detect things that they may want changed earlier in the production process.

DURHAM FIRE DEPARTMENT PUMPER SPECIFICATIONS

Yes	No