Clinton Volunteer Fire Department
Tanker Specifications

Bidder Complies	
Yes	No

INTENT OF SPECIFICATIONS

It is the intent of these specifications to cover the furnishing and delivery to the purchaser of a complete apparatus equipped as herein specified. With a view to obtaining the best results and the most acceptable apparatus for service in the fire department, these specifications cover the general requirements as to the type of construction, together with certain details as to finish, equipment, and appliances with which the successful bidder must conform. Minor details of construction and materials where not otherwise specified are left to the discretion of the contractor, who shall be solely responsible for the design and construction of all features.

Each bidder will furnish satisfactory evidence of their ability to construct the apparatus specified, and will state the location of the factory where the apparatus is to be built. The bidder will also show that they are in a position to render prompt service and furnish replacement parts for said apparatus.

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 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' experience manufacturing and field-testing aluminum bodies 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.

Bidder Complies	
Yes	No

CONTRACTOR'S SPECIFICATIONS

Each bid will be accompanied by a set of "Contractor's Specifications" consisting of a detailed description of the apparatus and equipment proposed and to which the apparatus furnished under contract must conform.

These specifications will indicate size, type, model, and make of all component parts and equipment.

TIMELY PROPOSALS

It is the bidder's responsibility to see that their proposals arrive on time. Late proposals, facsimiles, e-mails, telegram, or telephone bids will not be considered.

BID DRAWINGS

All bid drawings will be stamped PRELIMINARY DRAFT.

* A total of three (3) 11” x 17” drawing will be supplied per proposal book
* Compartment door opening dimensions will be shown on table on the drawing which will refer to each compartment number, such as L1, R1 etc
* Drawings will show five (5) views. (Left, Right, Front, Rear, Top) with the exception of chassis that are not always available as Auto Cad drawings
* OAL (Overall Length) in Feet & Inches -
  Estimated length will be rounded up to the nearest inch
* OAH (Overall height) in Feet & Inches
  Estimated height will be rounded up to the nearest inch
* Body dimensions shown - Front of the body to centerline of the rear axle
* Wheelbase in inches
* Estimated in-service weight
* Turning clearance radius
* Front and rear overhang in inches
* Warning lights
* D.O.T. lights
* Scene Lights
* Front bumper layout
* Roll up doors will be shown in open position.
* Compartment depth break over measurement. The measurement where the compartment switches from full depth to shallow depth

* Angle of approach and departure
* Top view of chassis

Text Block Items

* Chassis Model
* Total Compartment cubic feet
* Drawing box is to read “BID” and utilize the Bid Number
* Drawings will be printed on white paper with black ink; blue line drawings will not be acceptable.

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.

DRIVELINE LAYOUT CONFIRMATION

During the design phase of the chassis the Spartan 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.

BID FORMS / SPECIFICATIONS

All bid forms will be submitted on the attached bid form. The bid form and / or these specifications will be filled out by checking either the "YES" or "NO" column for each and every section / paragraph. Failure to use this form and / or these specifications will be cause for immediate rejection of any bid.

STATEMENT OF EXCEPTIONS

The proposed apparatus as described in this specification document and all related material with the bid package will meet or exceed all applicable sections for the category of apparatus as defined by NFPA 1901, unless specifically noted within this specification or other official documents associated with this bid.

Should any area, section or portion of the apparatus not meet the intent and applicable requirements, Notification will be made immediately to the purchaser, to rectify the situation to the **Clinton Vol. Fire departments satisfaction.**

Bidder Complies	
Yes	No

EXCEPTION TO SPECIFICATIONS

The following chassis and body specifications will be strictly adhered to. Exceptions will be allowed if they are equal to or superior to that specified (as judged by the purchaser), and provided they are listed and fully explained on a separate page entitled "EXCEPTIONS TO SPECIFICATIONS". Exception lists will refer to the specification page number. Each check in the "NO" column will be listed and fully explained. Where no check is made in a particular paragraph either "YES" or "NO", it will be assumed the bidder is taking exception to that paragraph. If a paragraph contains an empty column, where the bidder neglected to check the proper "YES" or "NO" column, it is assumed the bidder is conforming to the requirements of this paragraph.

Where "NO EXCEPTION" is noted in the specifications, there shall be no substitute or deviation to the specifications.

PROPOSALS TAKING TOTAL EXCEPTION TO THESE SPECIFICATIONS WILL BE IMMEDIATELY REJECTED REGARDLESS OF PRICE.

THIS SPECIFICATION HAS BEEN DESIGNED BY THE CLINTON FIRE DEPARTMENT FOR THE TOWN OF CLINTON, CT. THEREFORE DEMO AND STOCK UNITS ARE NOT ACCEPTABLE AND SHALL BE IMMEDIATELY REJECTED REGARDLESS OF PRICE.

The buyer is aware that all bidders will have to take some exceptions. Therefore, **BIDDERS THAT TAKE NO EXCEPTIONS WILL BE REQUIRED TO MEET EVERY PARAGRAPH TO THE FULLEST EXTENT SHOULD THEIR BID BE ACCEPTED.**

"OR APPROVED EQUAL" CLAUSE

The mention in the specifications of apparatus, equipment or material by brand name or by such specified description of same as is hereby made, is intended to convey to the bidder's understanding, the degree of excellence required. Any article, equipment, or material ,which shall conform to the standards and excellence so established, and is of equal merit, strength, durability and appearance to perform the desired function, is deemed eligible for offer as a substitute. The qualifications of the offering shall be judged as to their conformance with these specifications. Any equipment offered other than herein specified shall be subject to a competitive demonstration and evaluation shall be subject to a competitive demonstration and evaluation by the using department. Such demonstration, if requested or required, shall be provided within ten working days after the receipt of bids.

Upon delivery, the apparatus will be inspected against THESE specifications and not those supplied by the bidder with their proposal. Deviations will not be acceptable unless they were noted as exceptions at the time of bid and the apparatus will be rejected until said deviations are corrected to the satisfaction of the buyer.

Decisions regarding the "or approved equal clause", will be the sole responsibility of the recipient of the bids, rather than those companies submitting bids.

ACQUAINTANCE WITH SPECIFICATIONS

It is the responsibility of the bidder to review all of the bidding requirements. Failure of a bidder to be acquainted with this information will not relieve them from any obligations of the bid requirements.

PROPOSAL SEQUENCE

It is preferred that bid specifications be submitted in the same sequence as these specifications for ease of checking compliance, but because we are encouraging multiple manufacturers to bid we will accept a Table of Contents. There will be no exceptions allowed to either one of these requirements. The apparatus committee intends to be thorough during the evaluation of bids process. In order to maximize efficiency and minimize the time it takes to thoroughly evaluate all received bids this requirement must be strictly adhered to.

AWARD OF CONTRACT

All bids submitted will be good for a minimum of 60 days during which time bid securities submitted with the proposals will be held by the purchaser. Criteria for the award will include, but not be limited to, the following:

* Apparatus Performance And Safety Levels / Considerations
* Completeness of proposal
* Accuracy of accompanying data
* Past performance of bidder
* Compliance with the detailed specifications
* Compliance with purchasers request(s) for personnel qualifications or certifications
* Exceptions and clarifications
* Financial stability of bidder
* Local representation of the manufacturer
* Serviceability of the proposed apparatus
* Service capabilities of the bidder's local representative
* Compliance with NFPA 1901
* Any other factor the purchaser deems relevant

After the evaluation and award process is complete, all bidders will be notified of the results and securities will be returned.

PURCHASER'S OBLIGATIONS

The purchaser reserves the right to accept or reject any or all bids on such basis as the purchaser deems to be in the Clinton Fire Department's best interest. All bidders will be advised that the purchaser is not bound in any manner to automatically accept the lowest bid.

BID BOND REQUIREMENTS

Each bid shall be accompanied by a bid bond in the amount of 10% of bid price. The bid bond shall be furnished by the manufacturer of the apparatus. Bids must remain firm for a period of sixty (60) days. An exception to this requirement will not be tolerated and will result in the immediate rejection of the bid. Checks and Cash are not acceptable forms of bond.

The successful bidder shall, within 15 days of contract execution, supply the purchaser with a 100 percent performance bond. The bid bond shall be executed in the name of the apparatus manufacturer, bonds in the name of any sales agent or representative company will not be acceptable. Failure to supply said performance bond will result in forfeiture of the supplied bid bond to the purchaser.

SAFETY REQUIREMENTS

It is required that the Bidder will meet all State and Federal safety standards and laws that are in effect on the date of the bid for the item(s) that are being specified and the particular use for which they are meant.

QUALITY AND WORKMANSHIP

The design of the apparatus will embody the latest approved automotive engineering practices. Experimental designs and methods will not be acceptable.

The workmanship will be of the highest quality in its respective field. Special consideration will be given to the following points: accessibility of the various units that require periodic maintenance, ease of operation (driving), and symmetrical proportions.

Construction will be rugged and ample safety factors will be provided to carry loads as specified.

Bidder Complies	
Yes	No

GENERAL CONSTRUCTION

The complete apparatus, assemblies, subassemblies, component parts, and so on, will be designed and constructed with due consideration to the nature and distribution of the load to be sustained and to the general character of the service to which the apparatus is to be subjected when placed in service.

All parts of the apparatus will be strong enough to withstand the general service under full load. The apparatus will be so designed that the various parts are readily accessible for lubrication, inspection, adjustment and repair.

The apparatus will be designed and constructed, and the equipment so mounted, with due consideration to distribution of the load between the front and rear axles, and side to side loading that all specified equipment, including a full complement of specified ground ladders, loose equipment, and firefighters; will be carried without overloading or injuring the apparatus as per requirements defined in NFPA 1901.

PROPRIETARY PARTS

It is the intention of the Purchaser for all bidder's to furnish the apparatus with major parts commonly used by the heavy-duty truck manufacturers and open market vendors where as replacement parts are more readily available and at reduced cost. The use of proprietary parts such as but not limited to axles, suspensions, engines, transmissions, frontal air bags, electronic controls, multiplexing systems, seats, pumps, gauges, foam systems, etc., may not be acceptable by the purchaser.

The main apparatus body structure will have an approximate width of 100" in order to maximize the enclosed compartment space of the apparatus. The 100" wide measurement represents the main body structure measured from the bottom, outermost rear corners of the apparatus body structure. Components affixed or fastened to the apparatus will increase the body width proportionately.

LIABILITY

The bidder, if their bid is accepted, will defend any and all suits and assume all liability for the use of any patented process, device or article forming a part of the apparatus or any appliance furnished under the contract.

Bidder Complies	
Yes	No

ROADABILITY

The apparatus, when fully equipped and loaded, will be capable of the following performance while on dry paved roads that are in good condition:

- A road test shall be conducted with the apparatus fully loaded and a continuous run of ten miles or more will be made, during which time the apparatus shall show no loss of power or overheating. The transmission drive shaft or shafts and rear axles shall run quietly and be free from abnormal vibration or noise throughout the operating range of the apparatus. The successful bidder shall furnish a Weight Certificate showing weights on the front axle, rear axle and total weight for the completed apparatus at time of delivery.

- From a standing start, the apparatus will be able to attain a speed of 35 mph (55 kmph) within 25 seconds on a level road without exceeding the maximum governed RPM of the engine

- From a steady pace of 15mph the vehicle shall accelerate to 35mph with in 30 seconds.
  This shall be accomplished by not moving the gear shift.

- The service brakes shall be capable of stopping the fully loaded vehicle in 35’ at 20 mph.

- The apparatus will be able to attain a maximum top speed of 70 mph on a level road.

- The apparatus will be able to maintain a speed of at least 25 mph on any grade up to and including 6 percent.

- The apparatus, fully loaded, shall be capable of obtaining a minimum speed of 50mph on level ground with the engine not exceeding its governed RPM.

FAILURE TO MEET TESTS

In the event the apparatus fails to meet the test requirements of these specifications on the first trials, second trials may be made at the option of the bidder within 30 days of the date of the first trials.

Such trials will be final and conclusive and failure to comply with these requirements will be cause for rejection. Failure to comply with changes as required to conform to any clause of the specifications within 30 days after notice is given to the bidder of such changes, will be cause for rejection of the apparatus.

Bidder Complies	
Yes	No

Permission to keep or store the apparatus in any building owned or occupied by the Department during the specified period, with the permission of the bidder, will not constitute acceptance.
No Exceptions

REGULATION COMPLIANCE

Where applicable, Bidder's specifications must fully comply with 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 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.

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 NFPA 1901 specifications and standards.

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).

Color printed photographs of similar apparatus and features manufactured by the Bidder shall be submitted with the proposal.

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.

An estimated Amp draw analysis of the proposed apparatus 12-volt electrical system shall be provided with the Bidders proposal. The analysis shall show estimated Amp draw of the apparatus responding to the scene and of the apparatus at the scene.

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.

Bidder Complies	
Yes	No

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.

Bidders shall state in the proposal, the number years of experience they have building aluminum body emergency vehicles.

INSURANCE

The Bidder shall provide with his bid a Certificate of Insurance listing the amount of his company's Product Liability insurance coverage. This insurance shall not be less than $7,000,000 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 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.

FULL DOCUMENTATION AT TIME OF DELIVERY

-- The Bidder must supply, at 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 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 Successful bidder shall warrant the apparatus to be free from defects in material and workmanship for a period of two (2) years. Component parts, if found to be defective, shall be repaired or replaced without cost to purchaser. This warranty shall be exclusive of the chassis, fire pump, and other trade accessories, which is normally warranted by their respective manufacturers.

In addition to the two-year base warranty, the following extended warranties shall be furnished if applicable:

- Twenty (20) year structural warranty.
- Ten (10) year paint warranty.
- Seven (7) year electrical warranty.
- Ten (10) year stainless steel plumbing warranty.

WATER TANK WARRANTY

The contracted tank manufacturer shall warrant that the tank provided shall be of first class workmanship and that under normal conditions shall show no defects due to faulty design, workmanship, or material for the Lifetime of the vehicle to the original owner.

PUMP WARRANTY

The contracted pump manufacturer shall warrant that the pump provided shall be of first class workmanship and that under normal conditions shall show no defects due to faulty design, workmanship, or materials for a period of five (5) years.

PUMP PLUMBING WARRANTY

The galvanized or stainless steel plumbing components as specified and ancillary brass fittings used in the construction of the water/foam plumbing system shall be warranted for a period of ten (10) years or 100,000 miles. This covers structural failures caused by defective design or workmanship, or perforation caused by corrosion, provided the apparatus is used in a normal and reasonable manner. This warranty is extended only to the original purchaser for a period of ten years from the date of delivery.

12 VOLT ELECTRICAL WARRANTY

The 12 volt electrical system and ancillary components used in the construction of the apparatus shall be warranted for a period of seven (7) years. This covers failures caused by defective design or workmanship, provided the apparatus is used in a normal and reasonable

Bidder Complies	
Yes	No

manner. This warranty is extended only to the original purchaser for a period of seven (7) years from the date of delivery.

Items specifically covered are:

* Electrical harnesses and harness installation
* Load Manager, switches, circuit breakers and relays
* LED Lighting: FMVSS required and warning lights
* Electrical connectors and connections against corrosion or deterioration

Items excluded as they are covered by specific warranties supplied by the manufacturer of the components.

* Chassis electrical systems and components installed by the chassis manufacturer.
* Batteries, battery chargers, two way radio equipment, and similar equipment.
* Periodic cleaning and tightening of battery terminal connections.
* Accident, negligence or unauthorized alteration of original equipment.

PAINT WARRANTY

The paint on the unit will be provided with a ten (10) year paint finish guarantee which will cover the finish for the following items:

* Peeling or delamination of the top coat and/or other layers of paint.

* Cracking or checking.

* Loss of gloss caused by defective finishes which are covered by this guarantee.

CHASSIS WARRANTY

Chassis shall be warranted by the chassis manufacturer as per the chassis manufacturer's issued warranty. Two (2) year minimum.

100% WARRANTY ON ALL OTHER ITEMS FOR (2) TWO YEARS !!!

THIS WILL NOT APPLY TO:

1. Normal maintenance services or adjustments.

2. Damage caused by negligence of normal maintenance.

3. Any vehicle which shall have been repaired or altered outside our factory in any way, so as, in our judgement, to affect its stability, nor which has been subjected to negligence, or accident, nor to any vehicle made by us which shall have been operated at a speed exceeding the factory rated speed, or loaded beyond the factory rated load capacity.

4. Major components such as purchased chassis and associated equipment furnished with chassis, signaling devices, generators, batteries, or other trade accessories in as much as they are usually warranted separately by their respective manufacturers or to ancillary equipment used in rescue or fire fighting.

5. Loss of time or use of vehicle, inconvenience or other incidental expenses.

THIS WARRANTY IS MADE EXPRESSLY IN LIEU OF ALL OTHER WARRANTIES, EXPRESSED OR IMPLIED, WITH RESPECT TO QUALITY, MERCHANTABLILITY, OR FITNESS FOR A PARTICULAR APPLICATION / PURPOSE.

A copy of the warranties for the Chassis, Body, Paint, etc will be furnished with each bidder's proposal.

SINGLE SOURCE WARRANTY COORDINATION

In order to protect the purchaser from divided warranty responsibility between chassis and body manufacturers, the authorized dealer of the selected manufacturer shall be responsible for all warranty coordination for the specified vehicle from bumper to bumper. While all fire apparatus have individual component warranties, the dealer shall act as the sole source warranty coordinator on the entire vehicle. This shall include the cab shell, chassis assembly, complete body structure and components. The authorized dealer shall be responsible for all costs associated with any warranty work. The authorized dealer shall be responsible for the transportation to and from the service facility for all warranty work.

OVERALL LENGTH REQUIREMENT

The overall length of the apparatus should not exceed 384".

OVERALL HEIGHT REQUIREMENT

The overall height of the apparatus should not exceed 120".

OVERALL WIDTH

Overall Width = 100" + rubrails.

COMPARTMENT SIZES

To be determined by manufacturer based upon other restrictions listed in this document, overall length, wheelbase, dump chute locations etc.

REQUESTED BID / EQUIPMENT OPTIONS

Located on pages 119-121 of this specification include some chassis / body options requested by the committee to be priced as an option/alternative/exception to the specification. Each are to be listed as a + or – to the final bid price from each bidder's proposal. (not to be included in the bid price)

Optional equipment pricing to be listed in the spaces provided in the bid document and on a separate pricing sheet for ease fire department review.

CHASSIS SPECIFICATION

CHASSIS SELECTION

The chassis specified is a Spartan Gladiator. Chassis equal in quality shall be considered. Bidder shall supply ample documentation to determine the quality of any non-Spartan Chassis specified by the bidder. All non-Spartan chassis bidders must be an authorized warranty service center for the chassis they specify.

MODEL

The chassis shall be a Gladiator 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.

MODEL YEAR

The chassis shall have a vehicle identification number that reflects a 2022 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 needed to be in compliance with those regulations.

Bidder Complies	
Yes	No

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. All applicable caution, warning, and safety notice labels shall be Innovative Controls brand. Where applicable to the location within the specific layout and label package of the cab and chassis, the labels shall include decorative chrome bezels. Designs shall include bezels that fit individual labels or packaged configurations of labels in certain common locations.

The following labels shall be Innovative Controls brand, each including a decorative chrome bezel (where applicable):

- Shoreline
- Aerial Stowed
- Aerial Breakers 2
- Air Conditioner
- Cab Tilt Plate
- Air Compressor Breaker
- Battery Conditioner Breaker
- Helmet Caution
- Horn Tag
- Q2B Tag
- Load Center Plate
- Not a Step Label
- Occupancy Tag
- Do Not Move
- Occupants Must Be Seated
- Do Not Stand
- Danger Do Not Weld
- Danger--Untrained Operator
- DEF Fill Access (Including Additional 2907 Optional Labels)
- Battery Direct
- Kneeling
- IFS Air Fault
- Engine Brake
- Retarder
- LR 100 Amp Node
- 300 Amp EPU
- 100 Amp Front O/R Node
- 100 Amp T/T Node
- 100 Amp RR O/R Node
- 10 Amp EPU
- Master Power
- 12 Volt Power

- Aerial Hours
- Pump In Drive
  Windshield Washer Fluid

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 1000 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.

VEHICLE ANGLE OF APPROACH PACKAGE

The angle of approach of the apparatus shall be a minimum of 8.00 degrees.

NFPA1901 Angle of Approach definition:
"To determine the angle of approach, place a thin steel strip against the front of the tires where they touch the ground or stretch a tight string from one front tire to the other at the front where they touch the ground. Determine the lowest point (component or equipment) on the vehicle forward of the front tire that would make the smallest angle of approach. Hang a plumb bob from the lowest point and mark the point on the ground where the point of the plumb bob touches. Measure the vertical distance from the ground to the point where the plumb bob was hung (distance *V*). Measure the horizontal distance from the plumb bob point to the steel strip or string running from front tire to front tire (distance *H*). Divide the vertical distance by the horizontal distance. The ratio of *V/H* is the tangent of the angle of approach. If the ratio is known, the angle of approach can be determined from a table of trigonometric functions of angles or from a math calculator. The standard requires a minimum angle of approach of 8.00 degrees: since the tangent of 8.00 degrees is 0.1405, if *V* divided by *H* is 0.1405 or larger, the angle of approach is 8.00 degrees or greater."

AXLE CONFIGURATION

The chassis shall feature a 6 x 4 axle configuration consisting of a tandem rear drive axle set with a single front steer axle.

Bidder Complies	
Yes	No

GROSS AXLE WEIGHT RATINGS FRONT

The front gross axle weight rating (GAWR) of the chassis shall be 23,000 pounds.

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

Actual (GAWR) to be determined by apparatus manufacturer engineer

GROSS AXLE WEIGHT RATINGS REAR

The rear gross axle weight rating (GAWR) of the chassis shall be 40,000 pounds.

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

Actual (GAWR) to be determined by apparatus manufacturer engineer

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. Chassis driveline pump provisions shall include an interlock feature for automatic setting of the park brake when the vehicle is shifted into pump mode while the transmission is in neutral, and the transmission output speed translates to less than 1 mph. When the conditions are met the driver side parking brake valve shall activate. Once shifted to road mode the condition for electric automatic brake engagement is no longer present and the driver's parking brake control valve shall function normally.

WATER & FOAM TANK CAPACITY

The chassis shall include a carrying capacity of 2201 gallons (8331 liters) to 3000 gallons (11,356 liters). 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, SMFD 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 six (6) seating positions.

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

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 99.40 inches wide with a minimum interior width of 91.00 inches. The overall cab length shall be 122.10 inches with 45.00 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 40.88 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 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 11.00 inches deep X 10.75 inches wide. The intermediate step shall measure approximately 10.25 inches deep X 12.00 inches wide. The height from the first step to the intermediate step and the intermediate step to the cab floor shall not exceed 13.63 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

Bidder Complies	
Yes	No

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.

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.

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 cab fascia shall include a classic box style, 304 stainless steel front grille. The grille shall measure 55.45 wide X 33.50 inches high X 1.50 inches deep. The upper portion of the grille shall be hinged to provide service access behind the grille. The grille shall include a minimum free air intake of 750.00 square inches. This shall include the premium beveled grille to match existing apparatus fleet. **NO EXCEPTIONS**

CAB UNDERCOAT

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

Bidder Complies	
Yes	No

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 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 purchaser 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 Sikkens paint.

CAB PAINT PRIMARY/LOWER COLOR

The primary/lower paint color shall be determined at the pre-construction meeting.

CAB PAINT SECONDARY/UPPER COLOR

The secondary/upper paint color shall be determined at the pre-construction meeting.

Bidder Complies	
Yes	No

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

Where the upper and lower paint colors meet a temporary 0.50-inch-wide black pinstripe shall be applied over this break line to offer a more finished look prior to the final pinstripe being installed by the OEM.

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.

The warranty details can be found in the chassis warranty document.

CAB PAINT INTERIOR

The visible interior cab structure surfaces shall be painted with an easy-to-clean 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.

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.

Bidder Complies	
Yes	No

CAB INSULATION

The cab ceiling and walls shall include a nonwoven polyester fiber insulation. The insulation shall act as a barrier absorbing noise as well as assisting in sustaining the desired climate within the cab interior.

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.

CAB STRUCTURAL WARRANTY

Summary of Warranty Terms:

THE FOLLOWING IS SUMMARY OF WARRANTY TERMS FOR INFORMATION ONLY. THE ACTUAL LIMITED WARRANTY TERMS CAN BE FOUND IN THE CHASSIS WARRANTY DOCUMENTS, WHICH CONTAINS THE COMPLETE STATEMENT OF THE WARRANTY. THE CHASSIS MANUFACTURER'S RESPONSIBILITY IS TO BE ACCORDING TO THE TERMS OF THE COMPLETE LIMITED WARRANTY DOCUMENTS.

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

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.

Bidder Complies	
Yes	No

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.

APPARATUS WIRING PROVISION

An apparatus wiring panel shall be installed in the center dash area behind the rocker switch panel which shall include eight (8) open circuits consisting of three (3) 20 amp, one (1) 30 amp, three (3) 10 amp, and one (1) 15-amp circuit, with relays and breakers with trigger wires which shall be routed to the rocker switch panel.

LOAD MANAGEMENT SYSTEM

The apparatus shall be equipped with a Class 1 Total System Manager (TSM) for performing electrical load management. The TSM shall have sixteen (16) programmable outputs to supply warning and load switching requirements. Outputs one (1) through twelve (12) shall be independently programmable to activate during the scene mode, the response mode, or both. These outputs can also be programmed to activate with the ignition or master warning switch, or to sequence and shed along with the priority. Output thirteen (13) shall be designated to activate a fast idle system. Output fourteen (14) shall provide a low voltage warning for an isolated battery. Output fifteen (15) is a user configurable output and shall be programmable for activating between 10.50 and 15.00 volts. Output sixteen (16) shall provide a low voltage alarm that activates at the NFPA required 11.80 volts. The TSM shall have a digital display to indicate system voltage in normal operation mode and also indicate the output configuration during programming mode. The TSM shall be protected against reverse polarity and shorted outputs and be enclosed in a metal enclosure to enhance EMI/RFI protection.

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.

AUXILIARY ACCESSORY POWER

An auxiliary set of power and ground studs shall be provided and installed behind the officer seat and shall be wired to a 40-amp breaker. The studs shall be 0.38-inch diameter and capable of carrying up to a 40-amp battery direct load.

EXTERIOR ELECTRICAL TERMINAL COATING

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 X15 engine. The X15 engine shall be an in-line six (6) cylinder, four-cycle diesel-powered engine. The engine shall offer a rating of 565 horsepower at 1800 RPM and shall be governed at 2100 RPM. The torque rating shall feature 1850-foot pounds of torque at 1000 RPM with 912 cubic inches (14.9 liter) of displacement.

The X15 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 2021 emissions standards using cooled exhaust gas recirculation and selective catalytic reduction technology.

Bidder Complies	
Yes	No

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 15W40 CK-4 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 alloy plate. The tunnel shall be a maximum of 46.50 inches wide X 29.00 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 an automatic high-idle speed control which shall be pre-set to operate when the engine is at a specified RPM to increase alternator output. This device shall operate only when the engine is running, and the transmission is in neutral with the parking brake set. The device shall disengage when the operator depresses the brake pedal, or the transmission is placed in gear, and shall automatically re-engage when the brake is released, or when the transmission is placed in neutral.

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.

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.
- There is no active ABS event.

The compression brake shall be controlled through an off/low/high rocker switch on the dash.

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 front of the chassis shall accommodate fluid fill for the engine oil through the grille. This area shall also accommodate a check for the engine oil. The transmission, power steering, and coolant fluid fills and checks shall be under the cab. The windshield washer fill shall be accessible through the front left side mid step.

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.

Bidder Complies	
Yes	No

REMOTE THROTTLE HARNESS

An apparatus interface wiring harness for the engine shall be supplied with the chassis. The 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 harness shall contain connectors for a FRC Pump Boss 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, 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.

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 AIR INTAKE

The engine air intake system shall include an ember separator. This ember separator shall be designed to protect the downstream air filter from embers using a combination of unique flat and crimped metal screens packaged in a heavy-duty galvanized steel frame. This multilayered screen shall trap embers and allow them to burn out before passing through the pack.

The engine air intake system shall also include an air cleaner mounted above the radiator. This air cleaner shall utilize a replaceable dry type filter element designed to prevent dust and debris from being ingested into the engine. A service cover shall be provided on the housing, reducing the chance of contaminating the air intake system during air filter service.

Bidder Complies	
Yes	No

The air intake system shall include a restriction indicator light in the warning light cluster on the instrument panel, which shall activate when the air cleaner element requires replacement.

ENGINE FAN DRIVE

The engine cooling system fan shall incorporate a thermostatically controlled, Horton fully variable type fan drive with SmartClutch J-1939 CAN controller.

The variable speed fan clutch only engages at the amount needed for proper cooling to 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. The fan speed shall include a J-1939 CAN clutch controller to receive signal from the engine control module to activate at variable rates of speed. Variable speeds shall be set through thermostatic and engine speed signals to run as efficiently and quietly as required to maintain temperature.

ENGINE COOLING SYSTEM

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

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

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

The cooling system shall include a one piece injected molded polymer fan with a three (3) piece 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 rearward oriented sight glass to observe coolant in the system. A cold fill and observation line shall be included within the frame mounted translucent recovery bottle 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.

Bidder Complies	
Yes	No

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 crossflow 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.

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 components.

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.

ENGINE COOLANT FILTER

An engine coolant filter with a shut-off valve for the inlet and outlet shall be installed on the chassis. The location of the filter shall allow for easy maintenance.

Proposals offering engines equipped with coolant filters shall be supplied with standard non-chemical type particulate filters.

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 systems hose shall be formed silicone hose and formed aluminized steel tubing and include stainless steel constant torque band clamps.

ENGINE COOLANT OVERFLOW BOTTLE

A remote engine coolant overflow expansion bottle shall be provided in the case of over filling the coolant system. The overflow bottle shall capture the expansion fluid or overfill rather than allow the fluid to drain on the ground.

ENGINE EXHAUST SYSTEM

The exhaust system shall include an end-in end-out horizontally mounted single module after treatment device, and 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 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 (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

An exhaust temperature mitigation device shall be shipped loose for installation by the body manufacturer on the vehicle. The temperature mitigation device shall lower the temperature of the exhaust by combining ambient air with the exhaust gasses at the exhaust outlet.

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.

The exhaust flex joint shall not include the thermal exhaust wrap.

TRANSMISSION

The drive train shall include an Allison model EVS 4000 torque converting, automatic transmission which shall include electronic controls. The transmission shall feature two (2) 10-bolt PTO pads located on the converter housing.

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

The transmission gear ratios shall be:

1st	3.51:1
2nd	1.91:1
3rd	1.43:1
4th	1.00:1
5th	0.74:1
6th	0.64:1 (if applicable)
Rev	4.80:1

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.

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 lever “T” style handle range selector with manual “bump” capability shall be provided and located to the right of the driver within clear view and easy reach. The shift lever shall have low (L), drive (D), neutral (N), and reverse (R) positions as well as a “bump” position for manual operation. 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 1:00 o'clock position.

DRIVELINE

All drivelines shall be heavy duty metal tube and equipped with MSI 1810 series universal joints for the main drivelines, and 1710 series for the inter-axle shaft. 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®. The drivelines shall include Meritor brand u-joints with thrust washers.

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. Manufacturer specific pump mounting holes shall be supplied for mounting the pump as specified by the OEM.

MIDSHIP PUMP / GEARBOX MODEL

The midship pump/gearbox provisions shall be for the proposed Hale pump.

MIDSHIP PUMP GEARBOX DROP

The Hale pump gearbox shall have an "S" (short) 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 110.00 inches.

FUEL FILTER/WATER SEPARATOR

The fuel system shall have a Racor GreenMAX 6600R fuel filter/water separator as a primary filter. The fuel filter shall have a drain valve and a see-through cover to allow visual inspection of fuel and filter condition. The Racor 6600R shall meet engine requirements for particulate size, collection capacity, removal efficiency, and water removal efficiency. The filter shall be capable of handling a maximum flow rate of 150 gallons per hour.

A secondary fuel filter shall be included as approved by the engine manufacturer.

An instrument panel lamp and audible alarm which indicates when water is present in the fuel-water separator shall also be included.

FUEL LINES

The fuel system supply and return lines installed from the fuel tank to the engine shall be black textile braided lines which are reinforced with braided high tensile steel wire. The fuel lines shall be connected with reusable steel fittings.

FUEL SHUTOFF VALVE

There shall be two (2) fuel shutoff valves which shall be installed, one (1) in the fuel draw line at the primary fuel filter and one (1) in the fuel outlet line at the primary fuel filter to allow the fuel filters to be changed without loss of fuel to the fuel pump.

A third fuel shutoff valve shall be installed in the fuel draw line, near the fuel tank to allow maintenance to be performed with minimal loss of fuel.

Bidder Complies	
Yes	No

ELECTRIC FUEL PRIMER

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

FUEL COOLER

An aluminum cross flow air to fuel cooler shall be provided to lower fuel temperature allowing the vehicle to operate at higher ambient temperatures. The fuel cooler shall be located behind the rear axle.

FUEL TANK

The fuel tank shall have a capacity of sixty-eight (68) gallons and shall measure 35.00 inches in width X 17.00 inches in height X 29.00 inches in length.

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 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 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. The fuel tank straps shall be powder coated black and then painted to match the frame components if possible.

FUEL TANK FILL PORT

The fuel tank fill ports shall be provided with two (2) left fill ports located one (1) in the forward position and one (1) in the middle position and the right fill port located in the middle position of the fuel tank.

FUEL TANK DRAIN PLUG

A 0.5-inch NPT magnetic 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. The weight capacity for the axle shall be rated to 23,000 pounds. This rating shall require special approvals from the wheel manufacturers.

FRONT AXLE WARRANTY

The front axle shall be warranted by Meritor for five (5) 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.

Bidder Complies	
Yes	No

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 an eleven (11) leaf spring pack in which the longest leaf measures 53.38 inch long and 4.00 inches wide. The springs shall be shot peened for long life and include a military double wrapped front eye. The springs shall be bolted in place with M20 10.9 bolts and have replaceable polyurethane bushings in the spring eyes. The spring capacity shall be rated at 23,000 pounds.

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.

Bidder Complies	
Yes	No

POWER STEERING GEAR

The power steering gear shall be a TRW model TAS 85 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 RT-40-160 tandem drive axle. The axle shall include precision forged, single reduction differential gearing, and shall have a rated capacity of 40,000 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 0.43 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 five (5) years with unlimited miles under the general 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

The tandem axle chassis shall include an inter-axle differential lock, which will allow both axles to be engaged as drive axles. 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 inter-axle differential control.

A driver controlled differential lock shall be installed on one of the tandem rear axles. 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 driver controlled differential lock shall be controlled by a separate 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 60 MPH +/-2 MPH at governed engine RPM.

REAR SUSPENSION

The tandem rear axle shall feature a Hendrickson Firemaax™ air suspension. Each axle will be independently suspended for optimum performance. The suspension shall include four optimized air springs mounted to cast structural trailing arms, transverse cross beams for increased roll stability and four heavy duty shock absorbers. Dual air height control valves shall be installed to ensure equal frame height on both sides of the vehicle regardless of the load. Axle alignment is maintained using four eccentric bushings at each frame bracket. The rear tandem suspension shall have 54.00-inch axle centers.

The rear suspension capacity shall be rated at 40,000 to 48,000 pounds.

REAR SHOCK ABSORBERS

Shock absorbers shall be supplied by the suspension manufacturer and installed on the rear axle suspension.

TIRE INTERMITTENT SERVICE RATING

The chassis shall be rated using Intermittent Service ratings provided to the emergency vehicle market by the tire manufacturers as the basis for determining the maximum vehicle load and speed.

FRONT TIRE

The front tires shall be Michelin 425/65R-22.5 20PR "L" tubeless radial XZY3 mixed service tread.

The front tire stamped load capacity shall be 22,800 pounds per axle with a nominal speed rating of 65 miles per hour when properly inflated to 120 pounds per square inch.

Bidder Complies	
Yes	No

The Michelin Intermittent Service Rating maximum load capacity shall be 24,396 pounds per axle with a maximum speed of 65 miles per hour when properly inflated to 120 pounds per square inch.

The Michelin Intermittent Service Rating maximum speed capacity shall be 22,800 pounds per axle with a speed rating of 75 miles per hour when properly inflated to 120 pounds per square inch.

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

REAR TIRE

The rear tires shall be Michelin 12R-22.5 16PR "H" tubeless radial XDN2 all-weather 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.

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

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

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

REAR AXLE RATIO

The rear axle ratio shall be 5.63:1.

TIRE PRESSURE INDICATOR

There shall be electronic chrome LED valve caps shipped loose for installation by the OEM which shall illuminate with a red LED when tire pressure drops 8psi provided. The valve caps are self-calibrating and set to the pressure of the tire upon installation.

Bidder Complies	
Yes	No

FRONT WHEEL

The front wheels shall be Alcoa hub piloted, 22.50-inch X 12.25-inch LvL One™ polished aluminum wheels. The hub piloted mounting system shall provide easy installation and shall include two-piece flange nuts. The wheels shall feature one-piece forged strength and shall include Alcoa's Dura-Bright® finish 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 as an integral part of the wheel. The hub piloted mounting system shall provide easy installation and shall include two-piece flange nuts.

BRAKE SYSTEM

A rapid build-up air brake system shall be provided. The air brake system shall include, at a minimum, a three (3) air tank, four (4) reservoir system with a total of 6236 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 tandem 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 six (6) sensor, six (6) modulator Anti-lock Braking System (ABS) shall be installed on the front and tandem 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 tandem 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 16.50-inch X 7.00-inch S-cam drum type.

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.

SUPPLEMENTAL BRAKE

A supplemental brake engagement shall be supplied that can only be engaged while the rear spring brakes are engaged. In addition to the mechanical rear brake engagement, the front service brakes shall also be engaged via air pressure, providing additional braking capability. Front service brake activation shall be accomplished with activation of the rear mechanical park brake valve.

PARK BRAKE CONTROL

A Meritor-Wabco manual hand control push-pull style valve shall operate the parking brake.

The parking brake actuation valve shall be mounted to the left side of the engine tunnel integrated into the transmission shift pod console within easy access of the driver.

Bidder Complies	
Yes	No

REAR BRAKE SLACK ADJUSTERS

The rear brakes shall include Meritor automatic slack adjusters installed on the axle which features a simple, durable design offering reduced weight. The automatic slack adjusters shall feature a manual adjusting nut which cannot inadvertently be backed off and threaded grease fittings for easy serviceability.

AIR DRYER

The brake system shall include a Wabco System Saver 1200 air dryer with an integral 100-watt heater with a Metri-Pack sealed connector. The air dryer incorporates an internal turbo cutoff valve that closes the path between the air compressor and air dryer purge valve during the compressor "unload" cycle. The turbo cutoff valve allows purging of moisture and contaminants without the loss of turbo boost pressure. The air dryer shall be located on the right-hand frame rail forward of the front wheel behind the right-hand cab step.

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 30/30 brake chambers which shall convert the energy of compressed air into mechanical force and motion. This shall actuate the brake camshaft, which in turn shall operate the foundational brake mechanism forcing the brake shoes against the brake drum. The TSE Type 30 brake chamber shall offer a 30.00 square inch effective area.

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.

Bidder Complies	
Yes	No

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 shall be plumbed with color coded reinforced nylon tubing air lines. The primary (rear) brake line shall be green, the secondary (front) brake line red, the parking brake line orange and the auxiliary (outlet) will be blue.

Brass compression type fittings shall be used on the nylon tubing. All drop hoses shall include fiber reinforced neoprene covered hoses.

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

The air inlet shall be installed on the left-hand side of the cab above the wheel well in the rearward position.

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 wheelbase, 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.

Bidder Complies	
Yes	No

WHEELBASE

The chassis wheelbase shall not exceed 198.00 inches.

REAR OVERHANG

The chassis rear overhang shall be 90.00 inches.

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, with the outer rail measuring 10.25 inches high X 3.50 inches deep upper and lower flanges X 0.38 inches thick with an inner channel of 9.44 inches high X 3.13 inches deep and 0.38 inches thick. Each rail shall be constructed of 110,000 psi minimum yield high strength low alloy steel. Each double rail section shall be rated by a Resistance Bending Moment (RBM) minimum of 3,213,100-inch pounds and have a minimum section modulus of 29.21 cubic inches. The frame shall measure 35.00 inches in width.

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.

A minimum of seven (7) fully gusseted 0.25-inch-thick cross members shall be installed. The inclusion of the body mounting, or bumper mounting shall not be considered as a cross member. The cross members shall be attached using zinc coated grade 8 fasteners. The bolt heads shall be flanged type, held in place by distorted thread flanged lock nuts. Each cross member shall be mounted to the frame rails utilizing a minimum of 0.25-inch-thick gusset reinforcement plates at all corners balancing the area of force throughout the entire frame.
.
Any proposals not including additional reinforcement for each cross member shall not be considered.

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.

REAR TOW DEVICE

The frame rails shall contain (3) holes per frame in a pattern specified by the OEM for mounting manufacturer supplied tow eyes at the rear of the frame at a location defined by the OEM.

Bidder Complies	
Yes	No

FRAME CLEAR AREA

The chassis frame shall be left clear of chassis mounted components inside and outside the frame rails from 22.00 inches behind the cab to 58.00 inches behind the cab to allow space for OEM installed components.

FRAME PAINT

The frame rails shall be hot dip galvanized and powder coated prior to assembly and attachment of any components. The components that shall be galvanized shall include:

- Main frame "C" channel or channels

The frame parts which are not galvanized shall be powder coated prior to any attachment of components. Parts which shall be powder coated shall include but are not limited to:

- Steering gear bracket
- Front splayed rails and fish plates
- Bumper extensions
- Cross members
- Cross member gussets
- Fuel tank mounting brackets
- Fuel tank straps (unless material/finish is specified in 3130 subcat)
- Air tanks (unless color coded tanks are specified in 3205 subcat)
- Air tank mounting brackets
- Exhaust mounting brackets
- Air cleaner skid plate
- Radiator skid plate
- Battery supports, battery trays and battery covers

Other non-galvanized under carriage components which are received from the suppliers with coatings already applied shall include but are not limited to:

- Suspension components
- Front and rear axles

All powder coatings, primers and paint used on the non-galvanized components shall be compatible with all metals, pretreatments and primers used. The crosshatch 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.

The chassis under carriage consisting of frame, axles, driveline running gear, air tanks and other assorted chassis mounted components shall then be painted Sikkens Red FLNA 32657. Paint shall be applied prior to airline and electrical wiring installation.

FRAME WARRANTY

Summary of Warranty Terms:

THE FOLLOWING IS SUMMARY OF WARRANTY TERMS FOR INFORMATION ONLY. THE ACTUAL LIMITED WARRANTY TERMS CAN BE FOUND IN THE CHASSIS WARRANTY DOCUMENTS, WHICH CONTAINS THE COMPLETE STATEMENT OF THE WARRANTY. THE CHASSIS MANUFACTURER'S RESPONSIBILITY IS TO BE ACCORDING TO THE TERMS OF THE COMPLETE LIMITED WARRANTY DOCUMENTS.

The frame and cross members shall carry a limited lifetime warranty to the original purchaser. The warranty period shall commence on the date the vehicle is delivered to the first end user.

FRONT BUMPER

The chassis shall be equipped with a severe duty front bumper constructed from structural steel channel. The bumper material shall be 0.38 thick ASTM A36 steel which shall measure 12.00 inches high with a 3.05-inch flange and shall be 104.50 inches wide with angled front corners.

The bumper shall be primed and painted as specified.

FRONT BUMPER EXTENSION LENGTH

The front bumper shall be extended a maximum of 16.00 inches ahead of the cab.

FRONT BUMPER PAINT

The front bumper shall be painted the same as the lower cab color.

FRONT BUMPER APRON

The 16.00 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.

Bidder Complies	
Yes	No

FRONT BUMPER COMPARTMENT CENTER

The front bumper shall include a compartment in the bumper apron located in the center between the frame rails to 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. No hose or compartment cover require, hose retention system to be determined at pre construction meeting.

Hose well must be capable of storing two (2) 50' lengths of Ponn Supreme hose with TFT Mid Matic Nozzle in a side by side flat load configuration.

MECHANICAL SIREN

The front bumper shall include an electromechanical 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 mounting hardware designed to recess or flush mount.

MECHANICAL SIREN LOCATION

The siren shall be recess mounted on the left side of the front fascia of the bumper, in the outboard position. The siren shall be mounted completely behind the face of the bumper to protect the siren from damage.

AIR HORN

The chassis shall include two (2) Grover brand Stutter Tone air horns which shall measure 21.00 inches long with a 6.00-inch round flare. The air horns shall be trumpet style with a chrome finish.

AIR HORN LOCATION

The air horns shall be recess mounted in the front bumper face, one (1) on the right side of the bumper in the inboard position relative to the right-hand frame rail and one (1) on the left side of the bumper in the inboard position relative to the left-hand frame rail.

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) Whelen Engineering Inc. model SP123BMC, 100 watt cast aluminum speaker provided. The speaker shall measure 7.25 inches tall X 9.25 inches wide X 5.25 inches deep. The speaker shall include a chrome grille.

ELECTRONIC SIREN SPEAKER LOCATION

The electronic siren speaker shall be located on the front bumper face on the right side outboard of the frame rail in the far outboard position.

FRONT BUMPER TOW EYES

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

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.

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 AUXILIARY PUMP

A manual cab tilt pump module shall be attached to the cab tilt pump housing.

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 25.00-foot cab tilt control harness shall be provided on the right side of frame just behind the cab. This harness shall consist of an 8.00-foot harness connected to the tilt pump and a 17.00-foot extension harness with a six (6) pin Deutsch connector with cap for mounting in a compartment in the body.

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.

CAB TILT LOCK DOWN INDICATOR

The cab dash shall include a message located within the dual air pressure gauge which shall alert the driver when the cab is unlocked and ajar. The alert message shall cease to be displayed when the cab is in the fully lowered position and the hold down hooks are secured and locked to the cab mounts.

In addition to the alert message an audible alarm shall sound when the cab is unlocked and ajar and the parking brake is released.

CAB WINDSHIELD

The cab windshield shall have a surface area of 2969.88 square inches and be of a two (2) piece wraparound design for maximum visibility.

The glass utilized for the windshield shall include standard automotive tint. The left and right windshield shall be fully interchangeable thereby minimizing stocking and replacement costs.

Each windshield shall be installed using black self-locking window rubber.

Bidder Complies	
Yes	No

GLASS FRONT DOOR

The front cab doors shall include a window which is 27.00 inches in width X 26.00 inches in height. These windows shall have the capability to roll down completely into the door housing. This shall be accomplished using electric actuation. The left and right front door windows shall be controlled using a switch on each respective side inner door panel. The left dash panel shall include a switch for each powered door window in the cab, exact location for switches to be determined at pre-construction.

There shall be an irregular shaped fixed window which shall measure 2.50 inches wide at the top, 8.00 inches wide at the bottom X 26.00 inches in height, more commonly known as "cozy glass" ahead of the front door roll down windows.

The windows shall be mounted within the frame of the front doors trimmed with a black anodized ring on the exterior.

GLASS TINT FRONT DOOR

The windows located in the left and right front doors shall have a standard grey automotive tint which shall allow seventy-five percent (75%) light transmittance.

GLASS REAR DOOR RH

The rear right hand side crew door shall include a window which is 27.00 inches in width X 26.00 inches in height. The window shall be a powered type and shall be controlled by a switch on the door panel ledge and on the driver's control panel.

GLASS TINT REAR DOOR RIGHT HAND

The window located in the right-hand side rear door shall include a standard grey automotive tint which shall allow seventy-five percent (75%) light transmittance.

GLASS REAR DOOR LH

The rear left hand side crew door shall include a window which is 27.00 inches in width X 26.00 inches in height. The window shall be a powered type and shall be controlled by a switch on the door panel ledge and on the driver's control panel.

GLASS TINT REAR DOOR LEFT HAND

The window located in the left-hand side rear door shall include a standard grey automotive tint which shall allow seventy-five percent (75%) light transmittance.

Bidder Complies	
Yes	No

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 severe duty design made of aluminum which shall be coated with a purchaser 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.

Six (6) adjustable louvers shall provide comfort for the front seat occupants and ten (10) adjustable louvers shall provide comfort for the rear crew occupants. The plenum shall be shortened to terminate in the mid crew area on cabs with 10.00 inch raised roofs and greater. This shortened plenum shall allow for the purchaser to utilize the upper rear center wall for compartmentation, equipment, or apparatus operations.

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 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 Aeroquip 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.

****The chassis manufacturer recommends that the overall climate system performance be based off third-party testing in accordance with the Society of Automotive Engineering standards as a complete system.***

Individual component level BTU ratings is not an accurate indicator of the performance capability of the completed system. System individual component BTU ratings:

- Air conditioning evaporator total BTU/HR: 82,000
- Air conditioning condenser total BTU/HR: 59,000
- Heater coil total BTU/HR: 98,000

Performance data specified is based on testing performed by an independent third-party test facility using a medium four-door 10" raised roof cab 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 in the center dash driver's switch 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 an easy-to-clean 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.

*****The chassis manufacturer recommends that the overall climate system performance be based off third-party testing in accordance with the Society of Automotive Engineering standards as a complete system.***

Individual component level ratings are not an accurate indicator of the performance capability of the completed system.
Refrigerant Compressor displacement: 19.1 cubic inches per revolution.

Bidder Complies	
Yes	No

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.

The engine tunnel insulation shall measure approximately 0.30 inch thick including a multi-layer foil faced glass cloth and polyester fiber layer. The foil surface acts as protection against heat, moisture and other contaminants. The insulation shall meet or exceed FMVSS 302 flammability test.

The insulation shall be cut precisely to fit each section and sealed for additional heat and sound deflection. The insulation shall be held in place by acrylic pressure sensitive adhesive.

INTERIOR TRIM FLOOR

The floor of the cab shall be covered with a multi-layer mat consisting of 0.25-inch-thick sound absorbing closed cell foam with a 0.06-inch-thick non-slip vinyl surface with a pebble grain finish. 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. The center dash electrical access cover shall include a gas cylinder stay which shall hold the cover open during maintenance.

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.

STEP TRIM

Each cab entry door shall include a three-step entry. The first step closest to the ground shall be constructed of SAE 304 stainless steel with embossed perforations and diamond shaped cutout. The perforations and cutouts shall allow water and other debris to flow through rather than becoming trapped within the stepping surface. The step shall feature a splash guard to reduce water and debris from splashing into the step. The splash guard shall have drainage holes beneath the back of the step to allow debris and water to flow through rather than becoming trapped within the stepping surface. The stainless-steel material shall have a number 8 mirror finish. 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.

Bidder Complies	
Yes	No

UNDER CAB ACCESS DOOR

The cab shall include an access door in the left crew step riser constructed of DA finish aluminum 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.

DOOR TRIM PURCHASER NAMEPLATE

The interior door trim on the front doors shall include a purchaser nameplate which states the vehicle was custom built for their Department.

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 rear outer edge of the door. The lowest portion of each door skin shall include a reflective tape chevron with red and white stripes and a Spartan logo. 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.

Bidder Complies	
Yes	No

INTERIOR SOFT TRIM COLOR

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

INTERIOR TRIM SUNVISOR

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 an easy clean-to-clean gray texture finish.

HEADER TRIM INTERIOR PAINT

The metal surfaces in the header area shall be coated with an easy-to-clean gray texture finish.

TRIM CENTER DASH INTERIOR PAINT

The entire center dash shall be coated with an easy-to-clean matte 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 an easy-to-clean matte gray texture finish.

TRIM RIGHT HAND DASH INTERIOR PAINT

The right-hand dash shall be painted with an easy-to-clean matte 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.

Bidder Complies	
Yes	No

SWITCHES CENTER PANEL

The center dash panel shall include twelve (12) rocker switch positons in a single row across the top 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.

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. Five (5) of the top row of switches shall be rocker type and the left one (1) shall be the headlight switch. Five (5) of the lower row of switches shall be rocker type and the left two (2) shall be the windshield wiper/washer control switch and instrument lamp dimmer switch. This shall include switches for window control.

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 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 four (4) rocker switch positions in a three (3) over one (1) switch configuration.

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.

POWER POINT DASH MOUNT

The cab interior shall include a 12-volt cigarette lighter type receptacle in the cab dash switch panel to provide a power source for 12-volt electrical equipment. The cab shall also include two (2) Blue Sea dual universal serial bus (USB) charging receptacles in the cab dash switch panel to provide a power source for USB chargeable electrical equipment. The USB port shall be capable of a 5 Volt-4.8-amp total output. The receptacles shall be wired battery direct. Exact location to be determined at pre construction meeting.

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 a digital seat position indicator with a seat position legend and integrated audible alarm in the switch panel.

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 applicable audible alarm shall remain active until all occupied seats have the seat belts fastened.

SEAT MATERIAL

The Bostrom Firefighter seats shall include a covering of extra high strength, wear resistant fabric made of durable low seam Durawear Plus™ 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. Durawear Plus™ meets or exceeds specification of the common trade name Imperial 1800. The material meets FMVSS 302 flammability requirements.
If applicable, Theatre style seats located in the cab shall be 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 BACK LOGO

The seat back shall include a purchaser specified logo. The logo shall be centered on the standard headrest of the seat back and on the left side of a split headrest. Logo design to be determined at the pre-construction conference.

SEAT DRIVER

The driver's seat shall be an H.O. Bostrom 500 Series Firefighter Sierra model seat. The seat shall feature eight-way electric positioning. The eight positions shall include up and down, fore and aft with 8.00 inches of travel, back angle adjustment and seat rake adjustment. The seat shall 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, automatic retractor and buckle

as an integral part of the seat assembly. The ABTS feature shall also include the RiteHite™ shoulder adjustment feature to provide enhanced comfort and safety by allowing customized seat belt fit.

The minimum vertical dimension from the seat H-point to the ceiling for this belted seating position shall be 35.00 inches measured with the seat height adjusted to the lowest position of 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 include a standard seat back incorporating all belts to seat feature (ABTS). The seat back shall 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.

- 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.

Bidder Complies	
Yes	No

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

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 a H.O. Bostrom 500 Series Sierra seat model. The seat shall feature a tapered and padded seat, and cushion. The seat shall be mounted in a fixed position.

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 ABTS feature shall also include the RiteHite™ shoulder adjustment feature to provide enhanced comfort and safety by allowing customized seat belt fit.

The minimum vertical dimension from the seat H-point to the ceiling for this 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 OFFICER

The officer's seat back shall include a Ziamatic brand Load and Lock™ walk away self-contained breathing apparatus ("SCBA") bracket. The walk away bracket shall meet NFPA 1901-03 9G dynamic requirements for cylinder restraint systems for use in crew compartments of fire truck cabs. The bracket shall consist of a back plate and a short back plate, both of which shall be thermoplastic coated for trouble free service. The bracket shall feature two (2) high cycle double coated clips which shall not mar the cylinders.

The bracket shall accommodate and secure all types of self-contained breathing apparatus cylinders. Each bracket shall include a model LLS strap assembly which shall meet the NFPA 1901-03 standard for SCBA retention and shall be easily adjustable.

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.

POWER SEAT WIRING

The power seat or seats installed in the cab shall be wired directly to battery power.

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.

Bidder Complies	
Yes	No

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 500 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 ABTS feature shall also include the RiteHite™ shoulder adjustment feature to provide enhanced comfort and safety by allowing customized seat belt fit.

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 seat back shall include a Ziamatic brand Load and Lock™ walk away self-contained breathing apparatus (“SCBA”) bracket. The walk away bracket shall meet NFPA 1901-03 9G dynamic requirements for cylinder restraint systems for use in crew compartments of fire truck cabs. The bracket shall consist of a back plate and a short back plate, both of which shall be thermoplastic coated for trouble free service. The bracket shall feature two (2) high cycle double coated clips which shall not mar the cylinders.

The bracket shall accommodate and secure all types of self-contained breathing apparatus cylinders. Each bracket shall include a model LLS strap assembly which shall meet the NFPA 1901-03 standard for SCBA retention and shall be easily adjustable.

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

SEAT MOUNTING REAR FACING OUTER

The rear facing outer seats shall offer special mounting positions which shall be 2.00 inches towards the rear wall offering additional space between the front seats and the outer rear facing seats.

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.

CAB FRONT UNDERSEAT STORAGE ACCESS

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

Bidder Complies	
Yes	No

SEAT COMPARTMENT DOOR FINISH

All underseat storage compartment access doors shall have an easy-to-clean gray texture finish.

WINDSHIELD WIPER SYSTEM

The cab shall include a triple arm linkage wiper system which shall clear the windshield of water, ice and debris. There shall be two (2) windshield wipers; each shall be affixed to a radial arm. 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 a fiber reinforced plastic composite with a black matt 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.

GRAB HANDLES

The cab shall include one (1) 18.00-inch knurled, anti-slip, one-piece exterior assist handle behind each cab door. The grab handle shall be made of SAE 304 stainless steel and be 1.25-inch diameter to enable non-slip assistance with a gloved hand.

REARVIEW MIRRORS

Retrac Aerodynamic West Coast style dual vision mirror heads model 613305 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 integral convex mirror installed in the mirror head below the flat glass to provide a wider field of vision. The flat and convex mirrors shall be motorized with remote horizontal and vertical adjustment. The control switches shall be mounted within easy reach of the driver. The flat and convex mirrors 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 in the mirror control panel on the left side dash.

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 SAE 304 polished stainless steel.

MUD FLAPS FRONT

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.

Bidder Complies	
Yes	No

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.

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, 8.00 inches apart. 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.

STARTER MOTOR

The single start electrical system shall include a Delco brand starter motor.

BATTERY CONDITIONER

A Kussmaul Auto Charge 40 LPC battery conditioner shall be supplied. The battery conditioner shall provide a 40-amp output for the chassis batteries and a 15-amp output circuit for accessory loads. The battery conditioner shall be mounted in the cab in the LH rear facing outer seating position.

BATTERY CONDITIONER DISPLAY

A Kussmaul battery conditioner with bar graph display shall be integrated into the electrical inlet.

ELECTRICAL INLET LOCATION

An electrical inlet shall be installed on the left hand side of cab over the wheel well in the forward position.

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 40 LPC Charger - 5 Amps
Kussmaul 40/20 Charger - 8.5 Amps
Kussmaul 80 LPC Charger - 13 Amps
Kussmaul EV-40 - 6.2 Amps
Blue Sea P12 7532 - 7.5 Amps
Iota DLS-45/IQ4 - 11 Amps
1000W Engine Heater - 8.33 Amps
1500W Engine Heater - 12.5 Amps
120V Air Compressor - 4.2 Amps
120V Dometic HVAC - 15 Amps

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.

Bidder Complies	
Yes	No

HEADLIGHTS

The cab front shall include four (4) rectangular LED headlamps with separate high and low beams mounted in bright chrome bezels. Each lamp shall include a heating system that de-ices the headlight.

HEADLIGHT LOCATION

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

FRONT TURN SIGNALS

The front fascia shall include two (2) Whelen model M6 4.00-inch X 6.00 inch amber LED turn signals which shall be installed in a chrome radius mount housing above and outboard of the front warning and head lamps.

SIDE TURN/MARKER LIGHTS

The sides of the cab shall include two (2) Tecniq S170 LED side marker lights which shall be provided just behind the front cab radius corners. The lights shall be amber with chrome bezels.

MARKER AND ICC LIGHTS

In accordance with FMVSS, there shall be five (5) Tecniq S170 LED cab marker lamps designating identification, center and clearance provided. These lights shall be installed on the face of the cab within full view of other vehicles from ground level. The lights shall be amber with chrome bezels.

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 when the ignition switch is in the "On" position and the parking brake is released.

INTERIOR OVERHEAD LIGHTS

The cab shall include a LED dome lamp located over each door. 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 switches on each lamp.

Bidder Complies	
Yes	No

LIGHTBAR PROVISION

There shall be three (3) light bars installed on the cab roof. The light bars shall be provided and installed by the chassis manufacturer. The light bar installation shall include mounting and wiring to a control switch on the cab dash.

CAB FRONT LIGHTBAR MODEL

See the light bar layout for specific details.

CAB FRONT LIGHTBAR

The lightbar provisions shall be for three (3) Whelen brand Freedom IV lightbars. Two (2) shall be mounted on the left and right side of the front cab roof, each at a 30.00-degree angle, each lightbar shall be 21.50 inches in length. One (1) shall be centered on the front of the cab roof and shall be 23.29 inches in length. The center lightbar shall feature two (2) red LED lights modules and an Opticom traffic controller. Each side angled lightbar shall feature three (3) red LED lights modules and two (2) clear LED light modules. The clear lights shall be disabled with park brake engaged. The cables shall exit the lightbars near the center of each lightbar.

LIGHTBAR SWITCH

The light bar shall be controlled by a rocker switch located on the switch panel. There shall be an additional rocker switch to control the clear lights only. The switches shall be clearly labeled for identification.

OPTICOM EMITTER

There shall be one (1) low profile LED Opticom™ emitter installed in the light bar. The emitter shall have a performance range of up to 2,500 feet to provide preemption at all intersections equipped with the Opticom™ infrared system. The emitter shall be wired in such a manner as to be disabled when the park brake is set. A switch in the main switch panel shall control the unit in conjunction with the park brake circuit.

FRONT SCENE LIGHTS

The front of the cab shall include one (1) HiViz model FireTech FT-B-72 LED scene light installed on the brow of the cab.

The housing shall be powder coated white.

FRONT SCENE LIGHT LOCATION

There shall be one (1) scene light mounted center on the front brow of the cab.

Bidder Complies	
Yes	No

FRONT SCENE LIGHTS ACTIVATION

The front scene lighting shall be activated by individual rocker switches for each of the three (3) separate scene lighting circuits. Each circuit shall be activated independently and shall include rocker switches labeled “Front Scene”, “Front Flood”, and “Front Spotlight”.

SIDE SCENE LIGHTS

The side of the cab shall include two (2) Firetech model FT-GESM Guardian Elite LED scene lights, one (1) each side which shall be surface mounted with a chrome bezel.

SIDE SCENE LIGHT LOCATION

The scene lighting located on the left and right sides of the cab shall be mounted in the upper mid forward portion of the 10.00 inch raised roof 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.

GROUND LIGHTS

Each door shall include a Tecniq T44 LED ground light mounted to the underside of the cab step below each door. The lights shall include a polycarbonate lens, a housing which is vibration welded and LEDs which shall be shock mounted for extended life.

GROUND LIGHTS

The ground lighting shall be activated when the parking brake is set, by the opening of the door on the respective cab side, and a rocker switch in the dash panel.

LOWER CAB STEP LIGHTS

The middle step located at each door shall include a Tecniq T44 LED light which shall activate with the opening of the respective door. The lights shall include a polycarbonate lens, a housing which is vibration welded and LEDs which shall be shock mounted for extended life.

INTERMEDIATE STEP LIGHTS

The intermediate step well area at the front doors shall include a TecNiq D06 LED light within a chrome housing. The front 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 a 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.

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.

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.

HEADLIGHT FLASHER

An alternating high beam headlight flashing system shall be installed into the high beam headlight circuit which shall allow the high beams to flash alternately from left to right.

Deliberate operator selection of high beams will override the flashing function until low beams are again selected. Per NFPA, these clear flashing lights will also be disabled “On Scene” when the park brake is applied.

HEADLIGHT FLASHER SWITCH

The flashing headlights shall be activated through a rocker switch on the switch panel. The rocker switch shall be clearly labeled for identification.

Bidder Complies	
Yes	No

INBOARD FRONT WARNING LIGHTS

The cab front fascia shall include two (2) Whelen M6 Super LED front warning lights in the left and right inboard positions. The lights shall feature multiple flash patterns including steady burn for solid colors and multiple flash patterns for split colors. The lights shall be mounted to the front fascia of the cab within a chrome bezel

INBOARD FRONT WARNING LIGHTS COLOR

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

OUTBOARD FRONT WARNING LIGHTS

The cab front fascia shall include two (2) Whelen M6 Super LED front warning lights in the left and right outboard 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.

OUTBOARD FRONT WARNING LIGHTS COLOR

The warning lights mounted on the cab front fascia in the outboard position 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 M6 series Super LED intersection warning lights, one (1) each side. The lights shall feature multiple flash patterns including steady burn.

INTERSECTION WARNING LIGHTS COLOR

The intersection lights shall be red with a clear lens.

INTERSECTION WARNING LIGHT'S LOCATION

The intersection lights shall be mounted on the side of the cab on the front radius.

Bidder Complies	
Yes	No

AUXILIARY INTERSECTION WARNING LIGHTS

The chassis shall include two (2) Whelen M6 series Super LED auxiliary intersection warning lights, one (1) each side. The lights shall feature multiple flash patterns including steady burn.

AUXILIARY INTERSECTION WARNING LIGHTS COLOR

The auxiliary intersection warning lights shall be red/clear with clear lens.

AUXILIARY INTERSECTION WARNING LIGHTS LOCATION

The auxiliary intersection warning lights shall be fully recessed in the steel channel bumper's angled front right and left corners.

SIDE WARNING LIGHTS

The cab sides shall include two (2) Whelen M6 Super LED warning lights, one (1) on each side. The lights shall feature multiple flash patterns including steady burn for solid colors and multiple flash patterns for split colors. The lights shall be mounted to the sides of the cab within a chrome bezel.

SIDE WARNING LIGHTS COLOR

The warning lights located on the side of the cab shall be red with clear lens.

SIDE WARNING LIGHT'S LOCATION

The warning lights on the side of the cab shall be mounted over the front wheel well directly over the center of the front axle.

SIDE AND INTERSECTOR WARNING SWITCH

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) FRC MaxVision surface mount water level light strips.

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.

Bidder Complies	
Yes	No

TANK LEVEL LIGHTS ACTIVATION

The tank level lights shall be pre-wired and coiled at rear of the cab for connection to the apparatus by the body builder.

TANK LEVEL LIGHTS LOCATION

There shall be water level lights mounted on each side of the cab, centered between the rear cab doors and the rear corners of the cab.

SIREN CONTROL HEAD

A Whelen 295SLSA1 electronic siren control head with hard wired microphone shall be mounted in the cab dash center panel in a location specified by the purchaser. The siren shall offer a selectable 100 or 200-watt output, radio broadcast, public address, and seventeen (17) Scan-Lock siren tones and hands-free operation which shall allow the operator to turn the siren on and off from the steering wheel horn ring if a horn/siren selector switch option is also selected. The siren circuitry shall be placed behind the rocker switch panels under the electrical cover with a 30.00-inch loop for the OEM to route as desired. This item is to be shipped loose for install by the body manufacturer, mounting location to be determined at pre-construction.

STEERING WHEEL HORN BUTTON SELECTOR SWITCH

A rocker switch shall be installed in the switch panel between the driver and officer to allow control of either the electric horn or the air horn from the steering wheel horn button. The electric horn shall sound by default when the selector switch is in either position to meet FMCSA requirements.

AIR HORN ACTIVATION

The air horn activation shall be accomplished by a left hand side Linemaster model SP491-S81 foot switch for the driver, a single momentary rocker switch on the panel and a right hand lanyard. 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 momentary rocker switch in the switch panel on the dash. Two (2) red momentary siren brake rocker switches shall be provided in the switch panel on the dash. Exact switch locations to be determined at pre construction meeting.

Bidder Complies	
Yes	No

MECHANICAL SIREN INTERLOCK

The siren shall only be active when master warning switch is on and the parking brake is not applied to prevent accidental engagement.

AUDIBLE WARNING LH FOOT SWITCH BRACKET

A 30.00-degree angled foot switch bracket, wide enough to accommodate (2) foot switches, shall be installed outboard of the steering column for specified driver accessible foot switch activations.

BACK-UP ALARM

An ECCO model 575 backup alarm shall be installed at the rear of the chassis with an output level of 107 dB. The alarm shall automatically activate when the transmission is placed in reverse.

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.

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.

Bidder Complies	
Yes	No

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 attention.

Bidder Complies	
Yes	No

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.

Bidder Complies	
Yes	No

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 left-hand overhead position. The speakers shall be installed inside the cab with two (2) speakers recessed overhead in the front portion of the cab rearward of the windshields and two (2) speakers on the upper rear wall of the cab.

AM/FM ANTENNA

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

CAMERA

An FRC branded inView 360-HD™ heavy duty 360° camera system powered by SEON shall be supplied. Three (3) HD cameras with box shaped housing shall be shipped loose for OEM installation in the body to afford the driver a clear view to the rear and sides of the vehicle and one (1) HD camera shall be mounted on the front of the cab, above the windshield.

The system shall provide a dual camera view. One (1) view shall be a stitched bird's eye 360.00 degrees view around the truck and one (1) shall be a direct feed from a single camera. This feed shall display the rear camera when the transmission is placed in reverse, the left or right camera with the activation of the respective side turn signal, or the front camera at all other times.

CAMERA DISPLAY

The camera system shall be wired to a 7.00 inch flip down HD monitor which shall include a color display and day and night brightness modes installed above the driver position.

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 Spartan Chassis. 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 Spartan.

Bidder Complies	
Yes	No

COMMUNICATION ANTENNA CABLE ROUTING

The antenna cable shall be routed from the antenna base mounted on the roof to the area behind 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 Spartan Chassis. The antenna base shall be provided by Spartan.

AUXILIARY COMMUNICATION ANTENNA CABLE ROUTING

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

ADDITIONAL COMMUNICATION ANTENNA

An additional antenna base, for use with and 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 base shall be mounted in the inboard position on the left hand front corner of the cab roof so not to interfere with light bars or other roof mounted equipment installed by Spartan Chassis. The antenna base shall be provided by Spartan.

ADDITIONAL COMMUNICATION ANTENNA CABLE ROUTING

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

EXTRA COMMUNICATION ANTENNA

An extra antenna base, for use with a 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 base shall be mounted in the left hand rear position in the rear corner of the cab roof so it does not interfere with light bars or other roof mounted equipment installed by Spartan Chassis. The antenna base shall be provided by Spartan.

Bidder Complies	
Yes	No

EXTRA COMMUNICATION ANTENNA CABLE ROUTING

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

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.

FIRE EXTINGUISHER

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

DOOR KEYS

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 Spartan Advanced Protection System shall be available for free download from the Spartan Chassis website to Spartan authorized OEMs, dealers and service centers, as well as the vehicle owner.

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.

Bidder Complies	
Yes	No

WARRANTY

Summary of Warranty Terms:

THE FOLLOWING IS SUMMARY OF WARRANTY TERMS FOR INFORMATION ONLY. THE ACTUAL LIMITED WARRANTY DOCUMENT CONTAINS THE COMPLETE STATEMENT OF THE CHASSIS MANUFACTURER'S LIMITED WARRANTY. THE CHASSIS MANUFACTURER'S RESPONSIBILITY IS TO BE ACCORDING TO THE TERMS OF THE COMPLETE LIMITED WARRANTY DOCUMENT.

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:

(1) Hard copy of the Engine Operation and Maintenance manual with digital copy

(1) Digital copy of the Transmission Operator's manual

(1) Digital copy 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.

Bidder Complies	
Yes	No

BODY SPECIFICATIONS

PAINT CONFIRMATION

There shall be a paint confirmation letter sent to the body manufacturer with paint spray outs to confirm the cab primary paint color and secondary paint color as determined at the pre construction meeting.

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.

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.

BODYGUARDS

The left and right body side compartment front panels shall be bright aluminum treadplate.

Bidder Complies	
Yes	No

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.

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 of any pockets for the accumulation of dirt and road salt, and to provide ease of cleaning.

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.

Bidder Complies	
Yes	No

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 shall not be acceptable.

COMPARTMENT WALLS

The compartment sidewalls and rear wall to be .125" smooth aluminum. All compartment seams will be 100% sealed so to provide a watertight 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)**

COMPARTMENT TOP OVERLAY

Compartment top framing shall be covered with a bright aluminum treadplate.

Anodized extruded aluminum drip moldings shall be located above the side compartment doors.

Bidder Complies	
Yes	No

BOOSTER TANK

The tank shall have a minimum capacity of 2500 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
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 6" 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.

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.

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.

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. When the chassis is two-tone, the body shall be painted the lower/primary color unless specified otherwise.

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 Flex-HD pull down strap to make for easy closing.

DOOR FINISH

The body side compartment roll up doors shall have a natural anodized finish.

EXTERIOR COMPARTMENT SIZES

All requested dimensions are approximate, due to some of the unique body design requests we understand that each bidder may offer different compartment sizes and lay outs.

Roadside, front to rear. (Nominal door opening sizes)

- 36" high x 40" wide x 27" deep. Roll-up door.

Curb Side, Front to rear. (Nominal door opening sizes)

1. 36" high x 40" wide x 27" deep. Roll-up door.

COMPARTMENT FINISH

To reduce marring and scuffing, the insides of the exterior compartments shall be painted with a durable light gray spatter type coating.

Bidder Complies	
Yes	No

SHELF & TRAY FINISH

Any shelves, trays, etc. shall be an aluminum lightly oscillated finish to allow for easy equipment mounting.

The rear of the tanker body shall have a flat back with no compartment or door.

BUMPER STEP

The rear bumper step shall be 16" 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 treadplate.

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

Four (4) spring-loaded folding step(s) with NFPA compliant slip resistant surface shall be provided and installed in the location(s) specified. The step(s) shall be heavy duty chrome-plated cast zinc with a non-lit polydomed logo label and built-in white step light located above the stepping surface.

36" ACCESS RAILS

Access rails shall be 1.25" diameter extruded aluminum tubing in chrome plated stanchions.

Two (2) 36" access rails shall be mounted at the rear of the body.

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.

CAB TILT INSTALLATION

Installation shall be provided for the cab tilt receptacle that is shipped loose with the chassis. The receptacle shall be located on the curbside pump panel.

TANK LEVEL INDICATOR, CHASSIS FURNISHED

The chassis furnished tank indicator(s) installation shall be completed and finish wired to the tank level sensor.

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 roadside behind the rear axle. The fuel fill shall hook up with flexible fuel hose and shall have a recessed filler with a brushed finish 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.

HELMET HOLDERS

The department shall provide and install near each seat position helmet holders or store their helmets in an enclosed cabinet to meet NFPA 1901 for use inside of crew cabs. The holders shall secure traditional and contemporary style helmets without any adjustment being required.

12 VOLT WIRING – CONVENTIONAL HARDWIRED

12 Volt, Custom Chassis, Conventional Hardwire Chassis

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 roadside and curb side front compartments.

The body shall be fabricated so as to provide protected wiring raceways.

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
* 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.

LAMP SEQUENCER/LOAD MANAGER - CHASSIS FURNISHED

Provisions will be provided within the electrical system for sequencing and load management.

In case of a low voltage situation, the system will shed the selected load until the proper voltage is maintained. After the voltage is stabilized the lights will then again switch on sequentially.

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.

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.

GROUND LIGHTS

The lights under the chassis entrance doors that are provided by chassis dealer shall be activated at minimum when the doors are opened in conjunction with other chassis specifications when applicable.

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.

Plymovent Exhaust tip shall be supplied by the purchaser for installation by the body manufacturer.

REAR TOW EYES

Two (2) heavy rear tow eyes, .75" x 4" with a 2.375" elongated hole, shall be bolted directly to the frame, located inside the compartment between the rear beavertails. They shall be furnished with stainless steel trim plates.

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.

REAR MUDFLAPS

A black hard rubber mudflap with the manufacturer's logo on it shall be installed behind the rear wheels, one (1) each side.

Bidder Complies	
Yes	No

FIRE PUMP

The pump shall be a Class "A" Midship Hale 1000 GPM Single Stage Model QMAX^{XS} Centrifugal Fire Pump.

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

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 NFPA. 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 SEAL

The pump shaft shall have only one packing gland located on inlet side of the pump. It shall be of split design for ease of repacking. The packing gland must be a full circle threaded design to exert uniform pressure on packing and to prevent 'cocking' and uneven packing load when it is tightened. It shall be easily adjusted by hand with rod or screwdriver with no special tools or wrenches required. The packing rings shall be of a unique, permanently lubricated, long-life graphite composition and have sacrificial zinc foil separators to protect the pump shaft from galvanic corrosion.

Bidder Complies	
Yes	No

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.

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.

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 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.

Bidder Complies	
Yes	No

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.

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.

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

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 unless provided on the governor. A warning label stating "Warning: Do Not Open Throttle Unless Light Is On." shall be installed adjacent to the throttle control.

Bidder Complies	
Yes	No

FIRE PUMP PRIMING SYSTEM

A Trident Model #31.001.7 air operated priming system shall be installed. The unit shall be of all brass and stainless steel construction and designed for fire pumps of 1,250 GPM (4,600 LPM) or more. Due to corrosion exposure no aluminum or vanes shall be used in the primer design. The primer shall be three-barrel design with ¾" NPT connection to the fire pump.

The primer shall be mounted above the pump impeller so that the priming line will automatically drain back to the pump. The primer shall also automatically drain when the panel control actuator is not in operation. The inlet side of the primer shall include a brass 'wye' type strainer with removable stainless steel fine mesh strainer to prevent entry of debris into the primer body.

Performance, Safety, and NFPA Compliance

The priming system shall be capable to a vertical lift to 22 inches of mercury and shall be fully compliant to applicable NFPA standards for vertical lift. The system shall create vacuum by using air from the chassis air brake system through a three-barrel multi-stage internal "venturi nozzles" within the primer body. The noise level during operation of the primer shall not exceed 75 Db.

Air Flow Requirements

The primer shall require a minimum of 15.6 cubic foot per minute air compressor and shall be capable of meeting drafting requirements at high idle engine speed. The air supply shall be from a chassis supplied 'protected' air storage tank with a pressure protection valve. The air supply line shall have a pressure protection valve set between 70 to 80 PSIG.

Primer Control

The primer control shall have a manually operated, panel mounted "push to prime" air valve; which will direct air pressure from the air brake storage tank to the primer body. To prevent freezing, no water shall flow to and from the panel control.

Power Requirements

To reduce the electrical power requirements on the fire apparatus the priming system shall be air powered. The system shall not require annual tear-down and maintenance, an electric motor or solenoid, electrical wiring, lubrication, belt drive, or clutch assembly.

Bidder Complies	
Yes	No

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."

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.

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

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 natural aluminum finish.
34" - 37" Side Mount Pump Compartment

PUMP COMPARTMENT (UN-PAINTED)

The pump will be black and the stainless plumbing will be left natural. The open bin area and the crosslays above the pump shall remain in a natural finish.

LIGHT IN PUMP COMPARTMENT

One (1) TecNiq #E10 Series LED light shall be provided in the pump compartment. Light to be switched through the gauge panel light switch. The light shall located to provide the best possible lighting within the compartment.

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).

PUMP PANELS

Roadside and curb side pump panels shall be constructed of black powder coated .125" aluminum. The pump panels shall also be removable and held in place with stainless steel fasteners. 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.

Bidder Complies	
Yes	No

PUMP GAUGE PANEL

The pump gauge panel shall be constructed of black powder coated .125" aluminum and be located above the roadside 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 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.

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.

PUMP PANEL LIGHTING, LED

An extruded aluminum shield shall be mounted above the roadside 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 pump operator as well as individuals connecting supply or discharge hoses to the apparatus must be familiar with water hydraulics hazards and component limitations.

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.

PUMP TEST ADAPTER

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

PRESSURE GOVERNOR and ENGINE MONITORING DISPLAY

Fire Research PumpBoss series PBA401-D00 pressure governor and monitoring display kit shall be installed. The kit shall include a control module, intake pressure sensor, discharge pressure sensor, and cables. The control module case shall be waterproof and have dimensions not to exceed 6 3/4" high by 4 5/8". The control knob shall be 2" in diameter with no mechanical stops, have a serrated grip, and a red idle push button in the center. It shall not extend more than 1 3/4" from the front of the control module. Inputs for monitored information shall be from a J1939 databus or independent sensors. Outputs for engine control shall be on the J1939 databus or engine specific wiring.

The following continuous displays shall be provided:

- Engine RPM; shown with four daylight bright LED digits more than 1/2" high
- Check engine and stop engine warning LEDs
- Engine oil pressure; shown on a dual color (green/red) LED bar graph display
- Engine coolant temperature; shown on a dual color (green/red) LED bar graph display
- Transmission Temperature: shown on a dual color (green/red) LED bar graph display
- Battery voltage; shown on a dual color (green/red) LED bar graph display
- Pressure and RPM operating mode LEDs
- Pressure / RPM setting; shown on a dot matrix message display
- Throttle ready LED.

The dot-matrix message display shall show diagnostic and warning messages as they occur. It shall show monitored apparatus information, stored data, and program options when selected

by the operator. All LED intensity shall be automatically adjusted for day and nighttime operation.

The program shall store the accumulated operating hours for the pump and engine to be displayed with the push of a button. It shall monitor inputs and support audible and visual warning alarms for the following conditions:

- High Battery Voltage
- Low Battery Voltage (Engine Off)
- Low Battery Voltage (Engine Running)
- High Transmission Temperature
- Low Engine Oil Pressure
- High Engine Coolant Temperature
- Out of Water (visual alarm only)
- No Engine Response (visual alarm only).

The program features shall be accessed via push buttons located on the front of the control module. There shall be a USB port located at the rear of the control module to upload future firmware enhancements.

The governor shall operate in two control modes, pressure and RPM. No discharge pressure or engine RPM variation shall occur when switching between modes. A throttle ready LED shall light when the interlock signal is recognized. The governor shall start in pressure mode and set the engine RPM to idle. In pressure mode the governor shall automatically regulate the discharge pressure at the level set by the operator. In RPM mode the governor shall maintain the engine RPM at the level set by the operator except in the event of a discharge pressure increase. The governor shall limit a discharge pressure increase in RPM mode to a maximum of 30 psi. Other safety features shall include recognition of no water conditions with an automatic programmed response and a push button to return the engine to idle.

In addition to the PumpBoss, an audible alarm buzzer shall be installed that shall sound when a signal from the PumpBoss activates it.

MASTER GAUGE ASSEMBLY

There shall be One (1) 4" white faced master pressure gauge, liquid filled, 0-400 PSI and one (1) 4" faced master vacuum gauge, liquid filled, -30-0-400 PSI along with test ports provided into one assembly with integrated labeling.

WATER LEVEL INDICATOR

One (1) Fire Research Tankvision water level indicator shall be provided on the pump operator's gauge panel. Indicator to have a pressure transducer that mounts on the outside of the booster tank.

Bidder Complies	
Yes	No

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)

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.

PUMP PIPING & AKRON VALVES

All discharge valves under 4" shall be Akron brand HD 8800 series. All discharge valves, 3" 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.

2-1/2" ROADSIDE AUXILIARY INLET

One (1) auxiliary 2-1/2" NST gated suction inlet shall be provided at the roadside 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.

TANK TO PUMP LINES, TWO - 3"

The piping from the tank to pump shall be two (2) 3" lines and shall each deliver not less than 500 GPM. Valves 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 lines.

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 operator's 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.

2-1/2" MAIN DISCHARGE VALVE, ROADSIDE

There shall be one (1) 2-1/2" discharge(s) provided at the roadside. 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 push pull 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.

ADAPTER, 3" NST x 5" STORZ 30 DEGREE

At the location(s) noted, one (1) 3" discharge outlet(s) shall be furnished with a 3" NST swivel rocker lug female x 5" Storz discharge adapter and a 5" Storz blind cap. The final termination shall be at a 30-degree angle.

2-1/2" FRONT PRECONNECT

There shall be one (1) 2-1/2" pre-connect(s) located at the front bumper. The discharge valve shall be a 2-1/2", 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 2-1/2" with the outlet equipped with a male chrome plated 2-1/2" NST 90-degree swivel elbow.

The 2-1/2" pre-connect shall have an individual bleeder drain that shall be piped toward the ground.

CROSSLAY'S

Two (2) crosslay(s) shall be mounted above the pumphouse nearest the cab. One (1) shall have the capacity of 200' of 2" Ponn Supreme double jacket fire hose with 2.5" couplings. One (1) shall have the capacity of 200' of 1.75" Ponn Supreme double jacket fire hose with 1.5" couplings. Each crosslay shall be individually plumbed, One (1) with a 2-1/2", 1/4 turn full flow drop out valve, 2-1/2" piping, and a 90 degree 2-1/2" male NST chicksan swivel adapter and One (1) with a 2", 1/4 turn full flow drop out valve, 2" piping, and a 90 degree 1.5" male NST chicksan swivel adapter. Controls shall be located on the pump panel.

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

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.

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

The remaining dunnage area located above the pump house, rearward of the crosslay's may be utilized for the storage of non preconnected hose, no plumbing provision needed.

Tracks for adjustable hose dividers shall extended the full length of the pumphouse on both sides; each end of upper pumphouse will have fixed walls.

Height of walls and dividers to be determined at pre construction meeting.

CROSSLAY DIVIDERS

Two (2) removable and adjustable crosslay divider(s) shall be provided.

VINYL CROSSLAY COVER

A red vinyl cover shall be installed over the crosslay area. Attachment options to be determined at pre construction meeting.

VINYL FLAPS

Each end of the crosslay area shall have red vinyl flaps installed to retain the hose load. The flaps shall be secured with shock cord fasteners or similar.

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 running board 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 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.

RECESSED HOSE WELLS

Two (2) recessed aluminum hose wells shall be furnished, one in the road side and one in the curb side running board. The hose wells 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 wells shall have an unpainted buffed aluminum finish. The hose wells 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.

STEP LIGHTS, LED

Step lights shall be TecNiq #D07 LED surface mounted lights with stainless steel case. The lights shall be wired through the marker light and parking brake circuit with the locations as follows:

Each side on the inside face of the beavertail to illuminate the rear hose bed access step area.

The front of the body, on the curb side and on the roadside to illuminate the running boards and side pump panel areas.

GROUND LIGHTS, LED

TecNiq model #T44-WD0B-1, 4" round LED ground lights with grommet will be installed under each stepping surface. Lights will be mounted under each pump panel running board and rear step. The lights shall be activated through the marker light and parking brake circuit.

DUMP VALVE & CHUTE, ELECTRICALLY OPERATED

This specification calls for a total of 5 dump chutes, see below for requested locations and detail.

The tank shall be equipped with a 10" 1050 Newton dump valve with an electrically operated control handle located one (1) each side. The valve shall be located outside the body with the dump chute extending flush with the end of the body. The body opening of the dump valves shall be finished with a stainless-steel trim band.

The booster tank shall be furnished with a reinforced mounting flange to allow for connection of the valve. The switch for the dump shall be located in the area specified.

The dump shall be stainless steel.

There shall be an 18" stainless steel telescoping extension chute installed on the Newton dump. The chute shall be electrically operated.

Locations :

Each side front of body as close to pump house as possible.

Each side rear of body as close to tailboard as possible.

DUMP CHUTE DOORS

A door manufactured from .100” aluminum treadplate shall be provided for the road and curb side dump chutes. The doors shall have a stainless-steel hinge across the top and a slide for smooth deployment of the chute. Each door shall include a rubber gasket and magnets for securing the doors.

DUMP VALVE & CHUTE, ELECTRICALLY OPERATED

The tank shall be equipped with a 10" 1050 Newton dump valve with an electrically operated control handle located on the rear. The valve shall be located outside the body with the dump chute extending flush with the end of the body. The body opening of the dump valve shall be finished with a stainless-steel trim band.

The booster tank shall be furnished with a reinforced mounting flange to allow for connection of the valve. The switch for the dump will be located in the area specified.

The dump will be stainless steel.

There shall be an 18" stainless steel telescoping extension chute installed on the Newton dump. The chute will be electrically operated with a switch located on the body in the area specified.

Location – Rear of body/tank, centered

CAB DUMP SWITCHES

A maximum of ten (10) additional switches shall be provided to activate the electric dump control and or the electric dump chute control.

Switches to be located in the cab in the area specified as determined at the pre construction meeting

It is preferred that 1 switch control all functions of each individual chute, (Chute extend, Valve open) (Valve Close Chute retract,) etc

FOLDING TANK LOWERING DEVICE

The curbside of the apparatus shall be provided with a powered folding tank lowering device designed to support and secure a Fol-da-tank.

Control to be placed on the forward curbside of body. Positioning of control shall allow for downward motion of the rack by moving the control lever down and upward motion by moving the control up.

The rack is to be mounted on two (2) pivot arms using two (2) hydraulic actuators to raise and lower the rack. The rack will be equipped with an override that will allow the rack to be raised or lowered manually in the event of electrical failure.

An audible warning device shall sound when the rack is in motion and an interlock switch shall be provided to prevent the 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 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 rack is not fully nested.

FOLDING TANK RACK COVER

The folding tank rack shall have a vinyl cover. The cover shall be across the face of the rack. The cover shall be fastened to the rack.

SUCTION HOSE MOUNTING BRACKETS

One (1) suction hose bracket shall be furnished on each folding tank rack. Two (2) double loop Velcro straps shall hold each hose in place.

1 length of hose to be mounted on each tank rack, length to be detrmined at pre construction meeting.

LADDER COMPARTMENT THROUGH WATER TANK

An enclosed ladder compartment shall be furnished through the water tank, custom designed for the ladders carried. A single pan smooth aluminum door with a trigger latch shall be provided to allow ready access to the ladders at the back of the apparatus. The compartment shall be designed so that each ladder can be removed without disturbing the other ladders.

Compartment shall be designed to carry the following ladder compliment:

Duo-Safety model 900-A-24, 24' extension ladder shall consist of 2 aluminum sections.

Duo-Safety model 585-A-10, 1-section 10' folding ladder aluminum ladder with rubber feet.

Duo-Safety model 775-A-14, 14’ single section aluminum ladder with folding steel roof hooks on one end and steel spikes on the other end.

Bidder Complies	
Yes	No

SUCTION HOSE CHUTES THROUGH WATER TANK

An enclosed suction hose compartment shall be furnished that is custom designed for the suction hoses carried. The compartment shall include two dividers that allow the hoses to be enclosed on all four sides to prevent movement. The suction hose compartment shall be a part of the enclosed ladder compartment which is sleeved through the water tank. The compartment shall share the single pan smooth aluminum two-point deadbolt lock system door with the specified ladders.

2 lengths of flexible hard suction hose in chutes, 1 per chute. Exact Length of each section of hose to be determined at pre construction meeting.

REAR DIRECT TANK FILL(S)

There shall be two (2) 4" tank fill(s) at the rear of the apparatus. The tank fill shall have a semi-automatic fill valve manufactured by Fireman's Friend Engineering, Inc. The valve shall be an internally mounted check type fill valve of highly corrosive resistant stainless steel. The end of the valve(s) shall have a chrome plated 4" NST swivel, inlet strainer and a chrome plated plug with chain.

These direct tank fill intakes shall be mounted as low on the tank/body as possible.

HOSE BED

The body width above the side compartments shall be seventy (70") inches. There shall be no required provision for a hose bed between the side panels for carrying of any fire hose.

POLY RUB RAILS

Rub rails shall be provided and installed below each side compartment. The rub rail assembly shall be constructed of 1.00" x 2.50" heavy-duty black polyurethane with tapered ends. Rub rails shall be bolted to the lower exterior edge of the apparatus body, with 0.50" nylon spacers installed between the body and the rub rail.

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.

Bidder Complies	
Yes	No

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.

NATURAL ALUMINUM UNDERBODY & PAINTED WHEEL WELLS

The body undercarriage shall be left natural aluminum finish with the body wheel well liners primed and painted to match the color of the body. The undercarriage of the chassis shall be as is provided by the chassis manufacturer unless specified otherwise.

ENCLOSED WHEEL WELL COMPARTMENT

There shall be a fully enclosed compartment provided in the rear fender housing area and located as directed. The dimensions of the compartment shall be approximately 15.75" wide x 12.25" high x 25.5" deep with the area by the fenderette angled approximately 40 degrees. The compartment shall have an aluminum treadplate door with a spring-loaded latch.

Location : Curbside rear

TRIPLE SCBA BOTTLE COMPARTMENT

Two (2) SCBA bottle compartment(s) shall be provided in the rear fender housing area to accommodate storage of three (3) Scott 5500 psi 45 min. SCBA bottles. The compartment shall be constructed from aluminum with the bottle storage having lining to protect scuffing of the SCBA bottles. The compartment shall have an aluminum treadplate door with a spring-loaded trigger latch. The door shall be wired to the open-door light.

Locations :
Roadside front
Curbside front

TANK LEVEL LIGHT

There shall be one (1) additional FRC MaxVision surface mount water level light strip provided.

The light strip 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.

TANK LEVEL LIGHT ACTIVATION

The tank level lights shall be illuminated anytime that the park brake is set.

TANK LEVEL LIGHT LOCATION

There shall be a water level light mounted on the rear of the apparatus body, exact location to be determined at pre construction meeting.

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 M6 series Linear Super LED amber arrow light each side of body for turn signals.

One (1) rectangular Whelen M6 series Linear Super LED red light each side of body for stop and tail.

BACKUP LIGHTS

One (1) Whelen M6 series maximum intensity LED light with chrome flange shall be provided on each side of body for the backup light, wired to the reverse circuit of the truck transmission.

TRIM RINGS, STOP, TURN, BACK-UP, TAILLIGHTS, & LOWER WARNING

Bright chromed trim rings will be installed at rear and will house the stop, turn, back-up, taillights, & lower warning light of the Whelen M6 series. The lower warning light shall be the lowest device in the bezel.

AMDOR COMPARTMENT LED STRIP LIGHTS

Each compartment equipped with a roll up door shall have two (2) Amdor LED strip lights with a translucent lens.

POLISHED ALUMINUM LAMP BRACKETS

Rear deck lights and warning lights shall be mounted on polished aluminum lamp brackets. Brackets shall be attached to the rear hose body uprights. For protection the wiring shall be routed inside the lamp bracket and hose body upright.

HOSEBED LIGHTS – WALL MOUNTED

Two (2) 20" Amdor H2O LED strip lights shall be mounted in the front of the hosebed to illuminate the hosebed area. The lights shall be activated with the step light circuit.

SCENE LIGHT

There shall be six (6) FireTech, HiViz #FT-GESM Guardian Elite LED, 12-volt surface mounted light(s) with chrome bezel(s) provided and installed as specified. The scene light(s) shall produce 12,500 measured lumens of light output with 125 watts.

The light(s) shall be activated by a switch in the cab.

Locate two each side on the upper body sides, one toward the front and one toward the rear.

Locate two on the upper rear of the body.

Exact mounting locations to be determined at pre construction meeting

TRAFFIC ADVISOR

A Whelen TADP8 LED Traffic Advisor shall be installed on the rear of the body. The light shall be installed and surface mounted to eliminate the unsightly cables and mounting hardware. It shall be powered by an independent circuit. Traffic Advisor and Control box mounting locations shall be determined at the pre-construction meeting.

BEACON, WHELEN MICRO EDGE

There shall be Two Whelen NFPA zone C approved model MCFLED2R Red LED light assemblies with clear lens mounted on the vehicle. The lights shall be switched in the cab.

Bidder Complies	
Yes	No

LINEAR SUPER LED, SERIES M6, RED

Six (6) Whelen M6 series Linear Super LED red lights with clear lenses and chrome flange shall be provided and mounted as follows:

wheel well, 2 each side
1 each side, part of 4-light cluster housing

SUPER LED, ROTA-BEAM, AMBER WITH CLEAR LENS

One (1) Whelen 6RBAC Rota-Beam amber lights with clear lens and chrome flange will be provided and mounted as follows.

Mid rear roadside

SUPER LED, ROTA-BEAM, BLUE WITH CLEAR LENS

One (1) Whelen 6RBBC Rota-Beam blue lights with clear lens with chrome flange will be provided and mounted as follows.

Mid rear curbside

LETTERING AND STRIPING

Apparatus lettering Font to be consistent with current apparatus fleet as directed by the committee at the pre construction conference.

COMPUTER GENERATED LETTERING

The lettering and striping shall be custom designed utilizing state of the art computer software and computerized cutting machines. The manufacturer shall employ a full time artist / designer to generate all lettering, decals, and striping to meet the requirements of the Clinton Fire Department. The artwork for the lettering and striping shall be kept on record by the apparatus manufacturer to allow for ease in duplication for the Clinton Fire Department.

REFLECTIVE MATERIAL

A 3M diamond grade reflective tape shall be applied to the front face and sides of any roll-out/pull-out tray, shelf, or toolboard. The reflective tape shall be in a striped pattern and alternate between red and yellow. The tape shall be laminated, and the edge sealed. The stripe shall be placed to divert traffic to the back or away from the vehicle.

FRONT CAB DOOR LETTERING

Gold leaf, "Sign Gold", with drop shadow lettering shall be provided on the cab driver's and officer's doors per the fire department requirements. The design of the lettering on the cab doors shall be designed to fit in the 496 sq. inches available.

Lettering provided on the driver's and officer's cab doors shall be 3" high.

CLINTON
962
FIRE DEPT.

FRONT OF CAB LETTERING

Gold leaf, "Sign Gold", with drop shadow lettering shall be provided on the front of the cab per the fire department requirements. The design of the lettering on the front of the cab shall be designed to fit in the 167 sq. inches available.

Lettering provided on the front of cab shall be 3" high.

CLINTON

BODY SIDE LETTERING

Gold leaf, "Sign Gold", with drop shadow lettering shall be provided on both body sides per the fire department requirements. The design of the lettering on the body sides above wheel wells shall be designed to fit in the area available.

Lettering provided on the body sides shall be 4”letters for

CLINTON TANKER 962

SCOTCH-LITE STRIPE

A six (6) inch high "Scotch-Lite" stripe shall be provided. The stripe shall be applied on a minimum of 60 percent of each side of the unit, 60 percent on the rear of the unit and 40 percent on the front of the unit. The Scotch-Lite stripe layout shall be determined by the Clinton Fire Department.

The Scotch-Lite shall be white in color.

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.

Bidder Complies	
Yes	No

SCOTCH-LITE ACCENT STRIPES

A 1" high Scotch-Lite material accent stripe shall be incorporated into the Scotch-Lite scheme to border the primary Scotch-Lite stripe on the top and bottom edges. Final layout of this configuration shall be determined by the Clinton Fire Department.

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 EMBLEMS

Two (2) emblems shall be provided one (1) each side as directed by the Fire Dept. Emblems will be computer generated, 3M "Scotch-Cal", reflective, Gold Metallic Acrylic Vinyl with a black border. The Fire Department shall send photos for the artist to match.

Computer generated emblems provide a proportional layout design and durable finish.

CUSTOM AMERICAN FLAG DECAL

Two (2) custom made American Flag(s) shall be provided and installed as directed by the Clinton Fire Department. Scotch-Cal material shall be utilized for the decal.

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.

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.

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.

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 purchaser 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.

APPARATUS ALIGNMENT

The apparatus shall have a vehicle road performance wheel alignment conducted after completion of the vehicle assembly and prior to delivery from the Original Equipment Manufacturer. The alignment shall adjust front toe and steering wheel alignment to be within manufacturing specifications. This shall help prevent premature tire wear based on current weight distribution including equipment provided to the manufacturer and any water when applicable.

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.

Bidder Complies	
Yes	No

PRE-CONSTRUCTION MEETING

There shall be a pre-construction meeting and it shall be held at the OEM factory. The pre-construction meeting is the most important meeting during the after-sale production process. The purpose of this meeting is to finalize all aspects of the specifications, discuss and clarify all design details of the apparatus and to share or provide all information so all parties are in agreement on the apparatus being constructed. The ultimate goal of the pre-construction meeting is for the purchaser and dealer representative(s) to discuss and clarify all aspects of the proposed apparatus and to provide all necessary information to the apparatus manufacturer that shall ensure the apparatus is built to the satisfaction of all parties involved.
The apparatus manufacturer shall create and forward to the dealer a "Pre-construction" document containing the following items:
During this pre-construction meeting, any changes or clarifications must be documented on a manufacturer issued change order. The change order shall be signed by the purchaser and dealership and ultimately by the apparatus manufacturer. The change order becomes an extension of the contract with the official signatures of all three parties. All change order items resulting from the pre-construction meeting shall be implemented into the official shop order document.

PRE-PAINT INSPECTION

There shall be an inspection of the apparatus at the pre-paint stage of production by the purchaser at the apparatus manufacturer's showroom. The purchaser shall be given the opportunity to visually inspect the chassis, pump panel, plumbing, and all other body options so that any discrepancies may be addressed prior to the painting process. A company representative shall be present at the inspection to answer all questions. Adequate notice shall be given to the dealer as to when the apparatus will be available for inspection.

FINAL INSPECTION

The purchaser and/or dealer representative will inspect the final apparatus prior to it leaving the apparatus body manufacturer's facility. This will allow any changes that may be required, to be done so in a timely and inexpensive manner. After leaving the facility, all repairs or alterations will be performed by either the Dealer or an OEM approved service center.

The Clinton Fire Department maintains the right to inspect the apparatus, within normal business hours, at any other point during construction. Expenses incurred during non-specified inspection visits shall be the responsibility of the Clinton Fire Department.

During inspection visits, the Clinton Fire Department reserves the right to conduct actual performance tests to evaluate completed portions of the unit. Testing shall be accomplished with the assistance and resources of the contractor.

Bidder Complies	
Yes	No

OPTIONAL BID ITEM COSTS:

Bidder shall provide pricing for each individual option. The fire department shall reserve the right to choose which, if any, specific options it shall select.

Option 1:

The successful bidder shall provide three (3) factory inspection trips to the apparatus manufacturer's facility. Transportation, meals, lodging and other requisite expenses shall be the bidder's responsibility. Apparatus manufacturing facilities located greater than 400 miles from the Town of Clinton, CT shall be via commercial airline transportation. Departure and arrival shall be to the nearest major airport to the bidder's apparatus manufacturing facility.

Accommodations shall be for five (5) Fire Department representatives per trip.

The factory visits shall occur at the following stages of production of the apparatus:

Pre-construction / blueprint review.

Midpoint completion of entire apparatus. (Pre-Paint)

Final inspection upon completion.

Total: $ _____

Option 2:

The successful bidder shall provide three (3) factory inspection trips to the apparatus manufacturer's facility. Meals and other requisite expenses shall be the bidder's responsibility. Transportation and lodging for the committee members shall be The Town of Clinton's responsibility.

Accommodations shall be for five (5) Fire Department representatives per trip.

The factory visits shall occur at the following stages of production of the apparatus:

Pre-construction / blueprint review.

Midpoint completion of entire apparatus. (Pre-Paint)

Final inspection upon completion.

Total: $ _____

Bidder Complies	
Yes	No

OTHER CHASSIS/BODY OPTIONS

Stainless Steel body construction in lieu of aluminum body construction

Total: $ _____

Cummins X12 Engine in lieu of Cummins X15 Engine

Total: $ _____

Spartan Metro Star SMFD Cab in lieu of Spartan Gladiator SMFD cab

Total: $ _____

OPTIONAL EQUIPMENT :

The following equipment shall be priced, please provide separate pricing for any necessary mounting brackets not already accounted for in the construction of the body or compartmentation. All other NFPA required equipment shall be furnished and mounted by the purchaser.

Option 1

WHEEL CHOCKS

Two (2) Zico model SAC-44-E folding wheel chocks with brackets model SQCH-44-H

Total: $ _____

Option 2:

SUCTION HOSE

Four (4) Kockek 6" x 10' light weight PVC Suction hose with 6” male and 6" female camlock couplers.

Total: $ _____

Option 3:

10' FOLDING LADDER

A Duo-Safety model 585-A-10, 10' folding ladder shall consist of 1-section aluminum ladder with rubber feet shall be provided and installed in purchaser specified location. Ladder shall meet or exceed the latest NFPA standards.

Total: $ _____

Option 4:

14' ROOF LADDER

There shall be one (1) 14' Duo-Safety model 775-A-14, straight 1 section aluminum ladder with folding steel roof hooks on one end and steel spikes on the other end. Ladders shall meet or exceed latest NFPA standards.

Total: $ _____

Option 5:

24' EXTENSION LADDER

A Duo-Safety model 900-A-24, 24' extension ladder shall consist of 2 aluminum sections. Ladder shall meet or exceed NFPA standards.

Total: $ _____

Bidder Complies	
Yes	No

PAYMENT TERMS:

Manufacturer shall specify full purchase price in consideration of selection by purchaser of each of the below discounts for cash payments:

1. 100% down at contract signing, not including options
2. 50% down at contract signing not including options
3. Pre-Payment for cab and chassis, bidder must supply cost of chassis with bid, balance due upon acceptance, not including options
4. 100% payment upon acceptance, not including options

Also include financing / lease purchase options

Please submit this information on a separate sheet titled "payment options" in addition to the Town of Clinton documents for ease of committee review.

DELIVERY TIMELINE:

The vehicle, upon completion, will be delivered to the purchaser.

Delivery shall not exceed 420 calendar days from contract signing.

Delivery timelines shall not exceed 500 days without penalty.

END OF SPECIFICATIONS