ST. JOHNS FIRE
109 E. STATE STREET P.O. BOX 477 ST. JOHNS, MI 48879
PHONE 989-224-2151 / FAX 989-224-8893
CHIEF: JORDAN WHITFORD DEPUTY CHIEF: JOHN KOCHENSPARGER ASSISTANT CHIEF: MARK WINELAND

REQUEST FOR BIDS

Sealed bids will be accepted by the St. Johns Fire Department for the delivery of one (1) 2023 custom pumper in accordance with the attached specifications. Demo units or program trucks will NOT be accepted.

All bid response shall be addressed to:

Mindy Seavey, Clerk
100 East State Street, Suite 1100, P.O. Box 477
Saint Johns, MI 48879

Sealed bids will be accepted until 3:00 P.M on May 23rd, 2022. All bids must be sealed and clearly marked **"BID FOR FIRE APPARATUS"** on the outside of the proposal. Bids will be opened publicly and read aloud immediately following the closing of the accepted bid timeframe.

All bids should remain firm and shall not be withdrawn for a period of thirty (30) days from the date of the bid opening.

All questions are to be directed to:
Chief Whitford
jwhitford@stjohnsmich.com

If you choose not to bid, please mail or email a "no bid" letter by the above date and time.

The City of St. Johns reserves the right to reject any or all bids and to waive any defects in the bids in the best interest of the City of St. Johns and to accept the proposal which, in the opinion of the commission, best serves the interest and needs of the City of St. Johns.

If only one proposal is received, said proposal will be presented unopened to the city commission at their next regular meeting. The city commission, at said meeting, may or may not open and/or award based on the sole bid in the city commission's discretion.

The City of St. Johns does not discriminate on the basis of race, color, age, religion, sex, disability, and national origin; nor does it discriminate on the basis of handicap status and activities, as to employment or the provision of services. The City of St. Johns is an equal opportunity employer.

ST. JOHNS
FIRE DEPARTMENT

CUSTOM PUMPER SPECIFICATIONS

INTENT OF SPECIFICATIONS

It is the intent of these specifications to cover the furnishing and delivery to the **St. Johns Fire Department** of a complete fire apparatus equipped as hereinafter specified. With the view of obtaining the best results and the most acceptable apparatus for service, these specifications cover only the general requirements as to the type of construction and tests to which the apparatus must conform, together with certain details to furnish equipment and appliances with which the successful bidder must conform. Minor details of construction and materials, where not otherwise specified, are left to the discretion of the contractor who shall be solely responsible for the design and construction of all features. The NATIONAL FIRE PROTECTION ASSOCIATION pamphlet #1901 current edition for Motor Vehicle Apparatus, unless otherwise specified in these specifications shall prevail.

ONLY THE SPECIFIED FIREFIGHTING SUPPORT EQUIPMENT LISTED IN THESE SPECIFICATIONS SHALL BE PROVIDED.

The apparatus shall conform to all Federal motor vehicle safety standards.

Bids will only be considered from companies that have an established reputation in the field of fire and/or rescue apparatus manufacturing.

Each bid must be accompanied by a set of detailed contractors specifications consisting of a detailed description of the apparatus and equipment proposed. These specifications shall include size, location, type, and model of all component parts being furnished. Detailed information shall be provided on the materials used to construct all facets of the apparatus body. Any bidder who fails to submit detailed construction specifications shall be considered non-responsive and shall render their proposal ineligible for award.

Each bidder shall furnish a computer-generated weight and balance analysis for the unit being proposed. It shall address individual and combined axle weights and include an analysis on the vehicle's center of gravity. It shall also include a figure for excess payload capacity. Any bidder who fails to submit the weight and balance analysis in this format shall be considered non-responsive and shall render their proposal ineligible for award.

Each bidder shall furnish satisfactory evidence of the ability to construct the apparatus specified and shall state the location of the factory where the chassis and apparatus will be built. They shall also show that they are able to render prompt service and to furnish replacement parts for the completed apparatus chassis, body and components.

The manufacturer shall specify in his bid the number of working days and/or calendar days after acceptance of the formal contract by the manufacturer that the completed apparatus will be delivered by the purchaser. The manufacturer will not be held liable for changes arising from its failure to make or delay in making deliveries because of fire, flood, riot, major component shortage, accidents, acts of God, or any circumstances beyond their control.

QUALITY AND WORKMANSHIP

The workmanship must be of the highest quality in its respective field. Special consideration will be given to the following points:

1. Accessibility of the various components which require periodic maintenance or monitoring
2. Ease of vehicle operation (pumping and driving)
3. Visibility for the driver
4. Symmetrical proportions

Construction must be rugged, and design must be certified to carry the loads as specified and to meet the road and speed requirements as set forth under "PERFORMANCE TESTS AND REQUIREMENTS" of NFPA Pamphlet #1901 current edition.

Welding shall not be employed in the assembly of the apparatus in a manner that will prevent the removal of major components for service and/or repair.

DESIGN

The successful bidder shall be solely responsible for the design, construction and material used in the construction of the vehicle. The apparatus shall be of the latest design and type while using the most current industry construction techniques.

Each bidder shall supply with their bid a detailed drawing consisting of the driver side, passenger side and rear views of the apparatus. This drawing shall be representative of the apparatus being bid. The drawing must include but not be limited to all principal dimensions (height/width/length). Pictures or brochures are also encouraged that represent the quality of construction being proposed.

The apparatus, assemblies, component parts, etc., shall be designed and constructed with 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.

The apparatus shall be designed with great consideration given to overall vehicle weight and weight distribution. A computerized weight distribution calculation shall be included with the bid. A calculation shall include the chassis weight with all fluids and fuels topped off, estimated body weight, a 250-lb. allowance per seat for personnel and a 2,500 lb. distributed load allowance for equipment. Any bidder who fails to submit weight and balance calculations shall be considered non-responsive and shall render their proposal ineligible for award.

The apparatus shall be designed and constructed so component parts can be removed for service and repair with standard tools. Any special tools needed to service any component of the apparatus built or supplied by the component manufacturer shall be supplied with the apparatus. During the design and construction, the apparatus manufacturer shall take into consideration the ease of access to various areas requiring lubrication, inspection, service or adjustment.

The design and materials must be of the highest quality in its respective field. Quality control inspections shall be performed at each step of the manufacturing process.

The manufacturer shall meet the minimum requirements of NFPA Pamphlet 1901 current edition, The Underwriter's Laboratories, Inc. and all State and Federal Department of Transportation vehicle regulations at the time of the bid for this apparatus.

ROAD TEST

All road tests will be performed per NFPA Pamphlet #1901 current edition requirements.

LIABILITY

The successful bidder shall defend all suits and assume all liability for use of any patented process, device or article forming a part of the cab and chassis, or any appliance under the contract.

DELIVERY and/ DELIVERY DATA REQUIRED

1. The completed apparatus shall be delivered at the point of final manufacture.

2. The successful bidder's representative shall remain at the Fire Department until released by the Fire Chief or Commission during which time he shall instruct Fire Department personnel in the proper operation, care, and maintenance of the complete apparatus.

Information required at time of delivery to be supplied by the manufacturer:

A. Manufacturer's statement of origin

B. Electrical "as built" schematic booklet

C. Final build data sheet showing serial numbers for the following:

1. Cab and chassis VIN
2. Engine serial number
3. Transmission serial number
4. Apparatus/Body serial number

D. One copy of a complete operations and general maintenance instructions as delivered, including but not limited to the chassis, engine, transmission, axles, lubrication charts, rescue body and appropriate accessories.

E. The Underwriters Laboratories Incorporated Test Certification shall be provided on delivery of the apparatus.

F. The successful bidder shall supply all data required in NFPA Pamphlet #1901 current edition chapter 14 -20.

EXCEPTIONS TO SPECIFICATIONS

Each bidder response shall include a returned copy of this Request for bid with the yes/no columns checked for compliance to specifications.

All exceptions, no matter how minor must be marked in the “NO” column.

Those exceptions shall be listed on a separate sheet and shall refer to specification page number and paragraph. It will be mandatory for any perspective bidder that deviates from the proposed specifications, to give a full description of all deviations.

Bidder and his/her manufacturer being represented will be held responsible for deviations not specifically addressed or approved by the Fire Department. Items not addressed will be considered as being bid with no exception and will be included on the apparatus in the form presented in our specifications. Non-compliance will be grounds for rejection of the completed vehicle - **NO EXCEPTION.**

Failure to follow this method will add a considerable time to the bid review process and may be cause for rejection of the bid.

The purchaser will not consider proposals or demonstrators taking total exception to the bid specifications.

Where bidder's specifications and/or construction differ in any way from the bid specification, a full and complete description in the specification will be required. Drawings will also be required to show alternative construction methods. Partial descriptions or general clarifications covering groups or sections of the specifications will be unacceptable.

CLARIFICATIONS TO SPECIFICATIONS

Clarifications shall refer to specification page number and paragraph. Any such clarification that appears vague or misleading shall be considered an exception. Complete clarifications are required describing the reason for the deviation. Apparatus will be inspected upon delivery for compliance with specifications.

CONTRACT AWARD

The purchaser reserves the right to reject any or all bid proposals and purchase the equipment it deems most suitable to its needs. Since all components and materials are commercially available these specifications shall in no way be considered proprietary.

Price shall be based on payment upon receipt of the completed apparatus by the purchaser. No discounts or prepayment schedules shall be listed on the proposal page. All bidders are required to detail any payment terms for the apparatus and these terms shall be listed on a separate page entitled OPTIONS. These options may or may not be considered at the discretion of the purchaser.

All bids shall remain valid for 30 days after opening.

PAYMENT TERMS

The Purchaser agrees to purchase and pay cash for the apparatus and miscellaneous equipment pursuant to the following terms and conditions:

1. All prices shall be less any taxes.

2. The final payment for the apparatus shall be paid upon delivery and acceptance by the fire department per enclosed payment terms. An invoice shall be presented on or before delivery of the apparatus.

3. The apparatus, without exception, shall not be placed "In Fire Service" prior to full payment of apparatus.

SUBMISSION OF BIDS

Bids shall be submitted in accordance with the following instructions:

1. The bidder's proposed specifications shall be provided in full. Any deviations and clarifications shall be clearly marked.

2. The bidder's proposed specifications detailing their construction methods shall be provided. This is necessary to evaluate each bidder's actual intent of building the equipment as specified herein.

· The **bidder's proposed format shall be the same as these specifications to allow the customer to easily compare the bids, NO EXCEPTIONS.**

· **Bids are to be submitted in the same order as our specifications, NO EXCEPTIONS.**

3. Bids shall be returned in a sealed envelope clearly marked "BID FOR FIRE APPARATUS".

4. The purchaser reserves the right to accept or reject all bids, to waive irregularities and to make the award in any manner deemed to be in their best interest.

NFPA REQUIRED ITEMS

The purchaser shall be responsible for providing all equipment items required by NFPA pamphlet that are not otherwise indicated or addressed in these specifications.

CONSTRUCTION DRAWINGS

A basic drawing will be included with the proposal. Upon award a fully detailed drawing will be supplied to the Fire Department. The drawing shall be signed and returned to the manufacturer and kept on file for future reference.

DIMENSIONAL RESTRICTIONS

The maximum dimensions for this apparatus are to be within the following:

Length: 30'

These are to be represented on the approval drawing and will be checked for compliance during the acceptance process.

PRECONSTRUCTION CONFERENCE

The prime contractor will have a Pre-Construction Conference prior to any manufacturing. The purpose of meeting is to finalize all construction details. The location shall be at the manufacturing facility. All expenses for transportation, lodging and meals are paid for by the bidder. The selling dealer and/or representative will be present at the pre-construction conference.

INSPECTION TRIPS

Three (3) inspection trips for **two (2)** customer personnel will be arranged with all expense for transportation and meals paid for by the dealer. Transportation will be by motor vehicle unless otherwise indicated in the proposal. Trips more than 250 miles each way will be made by commercial air.
Timing of the trips shall be coordinated between the customer and selling dealer.

- Pre-Construction
- Mid-Point
- Final Inspection

PERIODIC APPARATUS INSPECTIONS

At any time during the build process, representatives of the department are always encouraged to visit the factory at any time during business hours to check-in on the progress of their new custom-built apparatus. A factory representative will always be on site to give updates and let department members see their truck as it is being built.

PROGRESS PICTURES

Progress pictures will be provided once body has started construction. Pictures will be provided throughout each phase of construction, paint, and assembly.

DELIVERY

The completed apparatus will be delivered under its own power to the customer's designated location. A factory delivery technician will accompany the apparatus.

Apparatus review will be provided by an authorized representative of the manufacturer as prescribed by the customer.

SEATING CAPACITY PLATE

A permanent plate indicating seat belt use and occupancy shall be installed in a visible location.

HELMET WARNING PLATE

A permanent plate stating "DO NOT WEAR HELMET" shall be installed in a visible location.

FLUID CAPACITY PLATE

A permanent plate listing all fluids and capacities shall be installed in a visible location.

OVERALL HEIGHT PLATE

A plate indicating overall height, overall length, overall width and the vehicle GVRW shall be installed in a location visible to driver.

TAILBOARD PLATE

A permanent plate shall be installed at the rear indicating "DO NOT RIDE ON REAR STEP".

CUSTOM CHASSIS

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 2023 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.

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 750 gallons per minute (3000 L/min). The apparatus shall include a water tank and hose body whose primary purpose is to combat structural and associated fires.

VEHICLE TYPE

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

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 4 x 2 axle configuration consisting of a single rear drive axle with a single front steer axle.

GROSS AXLE WEIGHT RATINGS FRONT

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

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

GROSS AXLE WEIGHT RATINGS REAR

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

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

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 750 gallons (2839 liters) to 1250 gallons (4732 liters). The water and/or foam tank(s) shall be supplied and installed by the apparatus manufacturer.

CAB STYLE

The cab shall be a custom, fully enclosed, medium four door model with a 10.00 inch raised roof over the driver, officer, and crew area, designed and built specifically for use as an emergency response vehicle by a company specializing in cab and chassis design for all emergency response applications. The cab shall be designed for heavy-duty service utilizing superior strength and capacity for the application of protecting the occupants of the vehicle. This style of cab shall offer up to eight (8) seating positions.

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

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

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

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

The exterior width of the cab shall be 94.00 inches wide with a minimum interior width of 88.00 inches. The overall cab length shall be 131.10 inches with 54.00 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 in the non-raised roof area and a rear floor to headliner height of 65.00 inches in the raised roof area, at a minimum. The cab shall offer an interior measurement at the floor level from the rear of the engine tunnel to the rear wall of the cab of 51.88 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 11.50 inches deep X 20.44 inches wide. The intermediate step shall measure approximately 10.25 inches deep X 22.75 inches wide. The height from the first step to the intermediate step and the intermediate step to the cab floor shall not exceed 12.80 inches.

OCCUPANT PROTECTION

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

The system components shall include:

- Driver steering wheel airbag
- Driver dual knee air bags (patent pending) with energy management mounting (patent pending) and officer knee airbag.
- Large driver, officer, and crew area side curtain airbags
- APS advanced seat belt system - retractor pre-tensioners tighten the seat belts around the occupants, securing the occupants in seats and load limiters play out some of the seat belt webbing to reduce seat belt to chest and torso force upon impact as well as mitigate head and neck injuries
- Heavy truck Restraints Control Module (RCM) - receives inputs from the outboard sensors, selectively deploys APS systems, and records sensory inputs immediately before and during a detected qualifying event

- Integrated outboard crash sensors mounted at the perimeter of the vehicle - detects a qualifying front or side impact event and monitors and communicates vehicle status and real time diagnostics of all critical subsystems to the RCM

- Fault-indicating Supplemental Restraint System (SRS) light on the driver's instrument panel

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

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 fascia shall include a box style, 304 stainless steel front grille 44.45 inches wide X 33.50 inches high X 1.50 inches deep. The grille shall include a minimum free air intake of 732.00 square inches. The upper portion of the grille shall be hinged to provide service access behind the grille. The grille shall be adorned with a waving American flag graphic.

CAB UNDERCOAT

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

CAB SIDE DRIP RAIL

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

CAB PAINT EXTERIOR

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

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

The entire cab shall then be coated with an intermediate solid or epoxy surfacing agent that is designed to fill any minor surface defects, provide an adhesive bond between the primer and the paint and improve the color and gloss retention of the color. The finish to this procedure shall be a sanding of the cab with 360 grit paper followed by sealing the seams with SEM brand seam sealer.

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

CAB PAINT MANUFACTURER

The cab shall be painted with Sikkens paint.

CAB PAINT PRIMARY/LOWER COLOR

The lower paint color shall be Sikkens FLNA 32572 Red.

CAB PAINT WARRANTY

Purchaser shall receive a Paint and Finish (Exterior Clear coated) Ten (10) Years limited warranty in accordance with, and subject to, warranty certificate RFW0710. The warranty certificate is incorporated by reference into this proposal, and included with this proposal or available upon request.

CAB PAINT INTERIOR

The visible interior cab structure surfaces shall be painted with a multi-tone onyx black 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.

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.

CAB STRUCTURAL WARRANTY

Purchaser shall receive a Cab Structure (Aluminum) Ten (10) Years or 100,000 Miles limited warranty in accordance with, and subject to, warranty certificate RFW0602. The warranty certificate is incorporated by reference into this proposal, and included with this proposal or available upon request.

CAB TEST INFORMATION

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

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

ELECTRICAL SYSTEM

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

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.

MULTIPLEX DISPLAY

The multiplex electrical system shall include a Weldon Vacuum Florescent Display (VFD) display which shall be located in the switch panel with a location specific to the customer's needs. The VFD display is a two (2) line, forty (40) character display capable of showing a wide range of data from the multiplex system.

In addition to showing system errors, the VFD shall display:

- Warning – Door Open
  Door Location
- Seat Violation
  Park Brake Released
- Emergency Master On
  Response Mode
- Emergency Master On
  Scene Mode

A momentary push button shall be located on the dash which when pressed acknowledges the current message and displays the next message. If no message is present, the VFD shall default to display the Fire Department Name.

The VFD display shall measure approximately 5.00 inches wide X 2.00 inches tall.

LOAD MANAGEMENT SYSTEM

The apparatus load management shall be performed by the included multiplex system. The multiplex system shall also feature the priority of sequences and shall shed electrical loads based on the priority list specifically programmed.

DATA RECORDING SYSTEM

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

- Vehicle Speed
- Acceleration
- Deceleration
- Engine Speed
- Engine Throttle Position
- ABS Event
- Seat Occupied Status
- Seat Belt Status
- Master Optical Warning Device Switch Position
- 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.

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 six (6) position Blue Sea Systems 5025 blade type fuse panel shall be installed behind the driver's seat. The fuse panel shall be protected by a 40 amp fuse. The panel shall be capable of carrying up to a maximum 40 amp battery direct load.

ADDITIONAL ACCESSORY POWER

An additional set of power and ground studs shall be provided and installed in the center of the cab overhead at the rear wall with a 40 amp breaker. The studs shall be 0.38 inch diameter and capable of carrying up to a 40 amp battery direct load. An additional 4.00 feet of wire shall be provided for use by the apparatus builder.

EXTERIOR ELECTRICAL TERMINAL COATING

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

ELECTRICAL SYSTEM WARRANTY

Purchaser shall receive an Electrical System Two (2) Years or 36,000 Miles limited warranty in accordance with, and subject to, warranty certificate RFW0202. The warranty certificate is incorporated by reference into this proposal, and included with this proposal or available upon request.

ENGINE

The chassis engine shall be a Cummins L9 engine. The L9 engine shall be an in-line six (6) cylinder, four cycle diesel powered engine. The engine shall offer a rating of 380 horse power at 2200 RPM and shall be governed at 2200 RPM. The torque rating shall feature 1150 foot pounds of torque at 1200 RPM with 543 cubic inches (8.9 liters) of displacement.

The L9 engine shall feature a VGT™ Turbocharger, a high pressure common rail fuel system, fully integrated electronic controls with an electronic governor, and shall be EPA certified to meet the 2021 emissions standards using cooled exhaust gas recirculation and selective catalytic reduction technology.

The engine shall include an engine mounted combination full flow/by-pass oil filter with replaceable spin on cartridge for use with the engine lubrication system. The engine shall include Citgo brand Citgard 500, or equivalent SAE 15W40 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. The tunnel shall be a maximum of 41.50 inches wide X 25.50 inches high.

DIESEL PARTICULATE FILTER CONTROLS

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

ENGINE PROGRAMMING HIGH IDLE SPEED

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

ENGINE HIGH IDLE CONTROL

The vehicle shall be equipped with a high-idle speed rocker switch and an automatic high-idle speed control. It shall be pre-set so when activated, it will operate the engine at the appropriate RPM to increase alternator output. This device shall operate only when the engine is running and the transmission is in neutral with the parking brake set. When automatically engaged the high idle shall disengage when the operator depresses the brake pedal, or the transmission is placed in gear, and shall be available to manually or automatically re-engage when the brake is released, or when the transmission is placed in neutral.

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.

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

ELECTRONIC ENGINE OIL LEVEL INDICATOR

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

FLUID FILLS

The 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.

REMOTE THROTTLE HARNESS

An apparatus interface wiring harness for the engine and transmission pump interlocks shall be supplied with the chassis. The harness shall include a connector for connection to a chassis pump panel harness supplied by the body builder and shall terminate in the left frame rail behind the cab for connection by the body builder. The harness shall include circuits deemed for a pump panel and shall contain circuits for a hand throttle, and a multiplexed gauge. Separate circuits shall also be included for a pump control switch, “Pump Engaged” and “OK to Pump” indicator lights, open compartment ground, start signal, park brake ground, ignition signal, master power, clean power, customer ignition, air horn solenoid switch, high idle switch and high idle indicator 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.

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.

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.

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

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

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

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.

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.

EMISSIONS SYSTEMS WARRANTY

Purchaser shall receive a Regulated Emissions Systems Five (5) Years or 100,000 Miles limited warranty in accordance with, and subject to, warranty certificate RFW0140. The warranty certificate is incorporated by reference into this proposal, and included with this proposal or available upon request.

TRANSMISSION

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

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

The transmission gear ratios shall be:

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

TRANSMISSION MODE PROGRAMMING

The transmission, upon start-up, will select a six (6) speed operation without the need to press the mode button.

TRANSMISSION FEATURE PROGRAMMING

The Allison Gen V/VI-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/VI-E transmission shall include prognostic diagnostic capabilities. These capabilities shall include the monitoring of the fluid life, filter change indication, and transmission clutch maintenance.

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

ELECTRONIC TRANSMISSION OIL LEVEL INDICATOR

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

TRANSMISSION SHIFT SELECTOR

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

TRANSMISSION PRE-SELECT WITH AUXILIARY BRAKE

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

TRANSMISSION COOLING SYSTEM

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

TRANSMISSION DRAIN PLUG

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

TRANSMISSION WARRANTY

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

PTO LOCATION

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

DRIVELINE

All drivelines shall be heavy duty metal tube and equipped with MSI 1710 series universal joints. The shafts shall be dynamically balanced prior to installation to alleviate future vibration. In areas of the driveline where a slip shaft is required, the splined slip joint shall be coated with Glide Coat®. 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.

MIDSHIP PUMP / GEARBOX MODEL

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

MIDSHIP PUMP GEARBOX DROP

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

MIDSHIP PUMP RATIO

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

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

The midship pump shall be located so the dimension from the centerline of the suction to the centerline of the rear axle is 99.00 inches.

PUMP SHIFT CONTROLS

One (1) pump shift control panel shall be mounted on the driver's dash panel. The following shall be provided on the panel: a three (3) position locking toggle switch; 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. One (1) label indicating pump instructions and 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 switch is in the up position and pump mode shall be selected when the switch is in the down position.

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

PUMP SHIFT CONTROL PLUMBING

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

FUEL FILTER/WATER SEPARATOR

The fuel system shall have a Fleetguard FS20121 fuel filter/water separator as a primary filter. The fuel filter shall have a drain valve.

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

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

FUEL LINES

The fuel system supply and return lines installed from the fuel tank to the engine shall be reinforced nylon tubing rated for diesel fuel. The fuel lines shall be brown in color and connected with brass fittings.

FUEL SHUTOFF VALVE

A fuel shutoff valve shall be installed in the fuel draw line at the primary fuel filter to allow the fuel filter to be changed without loss of fuel to the fuel pump.

ELECTRIC FUEL PRIMER

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

FUEL TANK

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

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

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

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

FUEL TANK MATERIAL AND FINISH

The fuel tank shall be constructed of 12 gauge aluminized 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 ASTM A-36 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 offset with the left fill port located in the rearward position and the right fill port located in the middle position on 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.

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.

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

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

FRONT SUSPENSION

The front suspension shall include a ten (10) leaf spring pack in which the longest leaf measures 54.00 inch long and 4.00 inches wide and shall include a military double wrapped front eye. Both spring eyes shall have a case hardened threaded bushing installed with lubrication counter bore and lubrication land off cross bore with grease fitting. The spring capacity shall be rated at 21,500 pounds.

STEERING COLUMN/ WHEEL

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

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

ELECTRONIC POWER STEERING FLUID LEVEL INDICATOR

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

POWER STEERING PUMP

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

FRONT AXLE CRAMP ANGLE

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

POWER STEERING GEAR

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

CHASSIS ALIGNMENT

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

REAR AXLE

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

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

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

REAR AXLE DIFFERENTIAL LUBRICATION

The rear axle differential shall be lubricated with oil.

REAR AXLE WARRANTY

The rear axle shall be warranted by Meritor for 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.

VEHICLE TOP SPEED

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

REAR SUSPENSION

The single rear axle shall feature a Reyco 79KB vari-rate, self-leveling captive slipper type conventional multi-leaf spring suspension, with 57.50 inch X 3.00 inch springs. One (1) adjustable and one (1) fixed torque rod shall be provided.

The rear suspension capacity shall be rated from 21,000 to 31,500 pounds.

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.

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 315/80R-22.5 20PR "L" tubeless radial XDN2 Grip all weather tread.

The rear tire stamped load capacity shall be 33,080 pounds per axle with a nominal speed rating of 75 miles per hour when properly inflated to 130 pounds per square inch.

The Michelin Intermittent Service Rating maximum load capacity shall be 35,396 pounds per axle with a maximum speed of 75 miles per hour when properly inflated to 130 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 5.38:1.

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.

FRONT WHEEL

The front wheels shall be Alcoa hub piloted, 22.50 inch X 12.25 inch aluminum wheels featuring a mirror polish on the outer face. The hub piloted mounting system shall provide easy installation and shall include two-piece flange nuts.

REAR WHEEL

The outer rear wheels shall be Alcoa hub piloted, 22.50 inch X 8.25 inch aluminum wheels with a mirror polished outer surface. The inner rear wheels shall be Alcoa hub piloted, 22.50 inch X 8.25 inch aluminum wheels with bright machine finish. The hub piloted mounting system shall provide easy installation and shall include two-piece flange nuts.

WHEEL TRIM

The front wheels shall include stainless steel lug nut covers and stainless steel baby moons. The baby moons shall have cutouts for oil seal viewing when applicable.

The rear wheels shall include stainless steel lug nut covers and band mounted spring clip stainless steel high hats.

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

BRAKE SYSTEM

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

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

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

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

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

The Electronic Stability Control (ESC) unit is a functional extension of the electronic braking system. It is able to detect any skidding of the vehicle about its vertical axis as well as any rollover tendency. The control unit comprises an angular-speed sensor that measures the vehicle’s motion about the vertical axis, caused, for instance, by cornering or by skidding on a slippery road surface. An acceleration

sensor measures the vehicle's lateral acceleration. The Controller Area Network (CAN) bus provides information on the steering angle. On the basis of lateral acceleration and steering angle, an integrated microcontroller calculates a theoretical angular speed for the stable vehicle condition.

FRONT BRAKES

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

REAR BRAKES

The rear brakes shall be Meritor 16.50 inch X 7.00 inch S-cam drum type. The brakes shall feature a cast iron shoe.

PARK BRAKE

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

PARK BRAKE CONTROL

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

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.

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 30/36 brake chambers which shall convert the energy of compressed air into mechanical force and motion. This shall actuate the brake camshaft, which in turn shall operate the foundational brake mechanism forcing the brake shoes against the brake drum. The TSE Type 36 brake chamber has a 36.00 square inch effective area.

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.

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.

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

FRAME

The frame shall consist of double rails running parallel to each other with cross members forming a ladder style frame. The frame rails shall be formed in the shape of a "C" channel, 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.
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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 (4) holes per frame in a pattern specified by the OEM for mounting tow eyes at the rear of the frame at a location defined by the OEM.

FRAME PAINT

The frame rails shall be hot dip galvanized 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 cross hatch adhesion test per ASTM D3359 shall not have a fail of more than ten (10) squares. The pencil hardness test per ASTM D3363 shall have a final post-curved pencil hardness of H-2H. The direct impact resistance test per ASTM D2794 shall have an impact resistance of 120.00 inches per pound at 2 mils.

FRAME ASSEMBLY STRUCTURAL

Purchaser shall receive a Frame Assembly Structural Twenty (20) Years or 100,000 Miles limited warranty in accordance with, and subject to, warranty certificate RFW0304. The warranty certificate is incorporated by reference into this proposal, and included with this proposal or available upon request.

FRAME RAIL CORROSION

Purchaser shall receive a Frame Rail Corrosion (Zinc Plate and Powder Coat) Twenty Five (25) Years or 150,000 Miles limited warranty in accordance with, and subject to, warranty certificate RFW0316. The warranty certificate is incorporated by reference into this proposal, and included with this proposal or available upon request.

FRAME COMPONENTS CORROSION

Purchaser shall receive a Frame Components Corrosion (Powder Coat) Three (3) Years or 48,000 Miles limited warranty in accordance with, and subject to, warranty certificate RFW0313. The warranty certificate is incorporated by reference into this proposal, and included with this proposal or available upon request.

FRONT BUMPER

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

FRONT BUMPER EXTENSION LENGTH

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

FRONT BUMPER APRON

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

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

FRONT BUMPER DISCHARGE

The chassis shall include frame mounted 2.00 inch diameter plumbed pipe intended for use as a discharge trash line. The discharge pipe shall be routed from the left hand front splay rail area behind the bumper to the area rear of the front axle, ahead of the battery box.

The discharge shall pipe shall be a, 2.00 inch stainless steel schedule 10 tube. The discharge shall include a Victaulic groove for connecting to the pump and discharge hose plumbing on each end of the tube.

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

FRONT BUMPER COMPARTMENT CENTER

The front bumper shall include a hose tray compartment in the bumper apron located in the center that shall measure 58.00 inches wide X 6.00 inches deep. The compartment shall be constructed of 0.13 inch 5052-H32 grade aluminum and shall include drain holes in the bottom corners to allow excess moisture to escape. The compartment shall include a cover constructed of 0.19 inch thick bright embossed aluminum tread plate.

FRONT BUMPER COMPARTMENT COVER HARDWARE

The front bumper raised compartment shall include a 7.00 inch stainless lift handle at the top center of the compartment lid. Gas cylinder stays shall hold the cover open. The raised cover shall be held in the closed position via two (2) pull to release rubber “T” style hold down handles located one (1) at each end of the cover.

MECHANICAL SIREN

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

MECHANICAL SIREN LOCATION

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

AIR HORN

The front bumper shall include two (2) Hadley brand E-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 on the exterior and a painted finish deep inside the trumpet.

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 in the center position between the frame rails.

FRONT BUMPER TOW HOOKS

Two (2) heavy duty tow hooks, painted to match the frame components, shall be installed in the rearward position out of the approach angle area, bolted directly to the side of each chassis frame rail with grade 8 bolts.

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 LIMIT SWITCH

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

CAB TILT CONTROL RECEPTACLE

A six (6) pin Deutsch receptacle that includes a cap shall be installed in the front bumper tail on the right hand side to provide a place to plug in the cab tilt remote control pendant.

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

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 with the parking brake released.

CAB WINDSHIELD

The cab windshield shall have a surface area of 2825.00 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.

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 manually utilizing a crank style handle on the inside of the door. A reinforced window regulator assembly shall be provided for severe duty use.

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 green automotive tint which shall allow seventy-five percent (75%) light transmittance.

GLASS REAR DOOR RH

The rear right hand side door shall include a window which is 27.00 inches in width X 26.00 inches in height. This window shall roll up and down manually utilizing a crank style handle on the inside of the door. A reinforced window regulator assembly shall be provided for severe duty use.

GLASS TINT REAR DOOR RIGHT HAND

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

GLASS REAR DOOR LH

The rear left hand side door shall include a window which is 27.00 inches in width X 26.00 inches in height. This window shall roll up and down manually utilizing a crank style handle on the inside of the door. A reinforced window regulator assembly shall be provided for severe duty use.

GLASS TINT REAR DOOR LEFT HAND

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

GLASS SIDE MID RH

The cab shall include a window on the right side behind the front and ahead of the crew door which shall measure 16.00 inches wide X 26.00 inches high. This window shall be fixed within this space and shall be rectangular in shape. The window shall be mounted using self locking window rubber. The glass utilized for this window shall include a green automotive tint unless otherwise noted.

GLASS TINT SIDE MID RIGHT HAND

The window located on the right hand side of the cab between the front and rear doors shall include a standard green automotive tint which shall allow seventy-five percent (75%) light transmittance.

GLASS SIDE MID LH

The cab shall include a window on the left side behind the front door and ahead of the crew door and above the wheel well which shall measure 16.00 inches wide X 26.00 inches high. This window shall be fixed within this space and shall be rectangular in shape. The window shall be mounted using self locking window rubber. The glass utilized for this window shall include a green automotive tint unless otherwise noted.

GLASS TINT SIDE MID LEFT HAND

The window located on the left hand side of the cab between the front and rear doors shall include a standard green automotive tint which shall allow seventy-five percent (75%) light transmittance.

CLIMATE CONTROL

The cab shall include a 57,500 BTU @ 425 CFM front overhead heater/defroster which shall be provided and installed above the windshield between the sun visors.

The cab shall also include a combination heater air-conditioning unit mounted on the engine tunnel. This unit shall offer eight (8) adjustable louvers, four (4) forward facing and four (4) rearward facing, a temperature control valve and two (2) blowers offering three (3) speeds which shall be capable of circulating 550 cubic feet of air per minute. The unit shall be rated for 42,500 BTU/Hr of cooling and 36,000 BTU/Hr of heating.

All defrost/heating systems shall be plumbed with one (1) seasonal shut-off valve at the front corner on the right side of the cab.

The air conditioner lines shall be a mixture of custom bend zinc coated steel fittings and Aeroquip flexible hose with Aeroquip EZ clip fittings.

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 and defrosting controls shall be located on the front overhead climate control unit. There shall be additional heating and air conditioning controls located on the engine tunnel mounted climate control unit.

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, open type compressor that shall be capable of producing a minimum of 32,000 BTU at 1500 engine RPMs. The compressor shall utilize R-134A refrigerant and PAG oil.

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 aluminum sheet metal coated with a customer specified interior paint or protective coating.

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.

POWER POINT DASH MOUNT

The cab shall include a 12 volt cigarette lighter type receptacle in the cab dash to provide a power source for 12 volt electrical equipment. The cab shall also include one (1) dual universal serial bus (USB) charging receptacle in the cab dash switch panel to provide a power source for USB chargeable electrical equipment. Each dual USB receptacle shall include two ports and shall be capable of up to a 5 Volt 2.1 amp output. Port 1 is optimized for fast charging at 1 amp. Port 2 is optimized for fast charging up to 2.1 amps, when used individually. The receptacles shall be wired battery direct.

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 in to 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 with a Flex-Tred® adhesive grit surface material.

UNDER CAB ACCESS DOOR

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

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 CUSTOMER NAMEPLATE

The interior door trim on the front doors shall include a customer 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. The chevron tape shall measure 6.00 inches in height.

INTERIOR GRAB HANDLE "A" PILLAR

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

INTERIOR GRAB HANDLE FRONT DOOR

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

INTERIOR GRAB HANDLE REAR DOOR

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

INTERIOR SOFT TRIM COLOR

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

INTERIOR TRIM SUNVISOR

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

INTERIOR FLOOR MAT COLOR

The cab interior floor mat shall be gray in color.

CAB PAINT INTERIOR DOOR TRIM

The inner door panel surfaces shall be painted with multi-tone onyx black texture finish.

HEADER TRIM INTERIOR PAINT

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

TRIM CENTER DASH INTERIOR PAINT

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

TRIM LH DASH INTERIOR PAINT

The left hand dash shall be painted with a multi-tone onyx black texture finish.

TRIM RIGHT HAND DASH INTERIOR PAINT

The right hand dash shall be painted with multi-tone onyx black texture finish.

REAR WALL INTERIOR PAINT

The rear wall of the cab shall be trimmed with aluminum sheet metal coated with a multi-tone onyx black texture finish.

DASH PANEL GROUP

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

SWITCHES CENTER PANEL

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

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

SWITCHES LEFT PANEL

The left dash panel shall include eleven (11) switches. There shall be six (6) switches across the top of the panel and five (5) across the bottom of the panel offset left. Five (5) of the top row of switches shall be rocker type and the left one (1) shall be the headlight switch. Three (3) 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.

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 two (2) rocker switch positions in the upper left hand portion of the panel.

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

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 seats shall be covered with a 45.00 ounce vinyl material. This material shall be semi- resistant to UV rays and from being saturated or contaminated by fluids.

SEAT COLOR

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

SEAT BACK LOGO

The logo shall be centered on the standard headrest of the seat back and on the left side of a split headrest.

SEAT DRIVER

The driver's seat shall be an H.O. Bostrom 400 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 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 the 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.

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

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

SEAT OFFICER

The officer's seat shall be 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 shall feature a SecureAll™ SCBA locking system which shall be one bracket model and store most U.S. and International SCBA brands and sizes while in transit or for storage within the seat back. The bracket shall be easily adjustable for all SCBA brands and cylinder diameters. All adjustment points shall utilize similar hardware and adjustments shall be made with one tool.

The bracket shall be adjustable to compensate for different cylinder lengths without the use of tools. The adjustment shall be made by raising a lever and moving the top clamp vertically**.**

The bracket system shall be free of straps and clamps that may interfere with auxiliary equipment on SCBA units. The center guide fork shall keep the SCBA tank in place for a safe and comfortable fit in the seat back cavity. The SCBA unit simply needs to be pushed against the pivot arm to engage the patented auto- locking system. Once the lock is engaged, the top clamp shall surround the top of the SCBA tank for a secure fit in all directions.

The SecureAll™ shall include a release handle which shall be integrated into the seat cushion for quick and easy release. This shall eliminate the need for straps or pull cords to interfere with other SCBA equipment.

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.

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. The seat shall include a "Fold and Hold" feature so that the cushion shall remain in the seated position and simply touched to flip up.

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 rear facing outboard seat shall feature a Bostrom SecureAll™ self contained breathing apparatus (SCBA) locking system which shall store most U.S. and International SCBA brands and bottle sizes while in transit or for storage within the seat back. The bracket shall be easily adjustable for all SCBA brands and cylinder diameters. All adjustment points shall utilize similar hardware and adjustments shall be made with one tool.

The bracket shall be adjustable to compensate for different cylinder lengths without the use of tools. The adjustment shall be made by raising a lever and moving the top clamp vertically**.**

The bracket system shall be free of straps that may interfere with auxiliary equipment on SCBA units. The center guide fork shall keep the SCBA tank in place for a safe and comfortable fit in the seat back cavity. The SCBA unit simply needs to be pushed against the pivot arm to engage the patented auto-locking system. Once the lock is engaged, the top clamp shall surround the top of the SCBA tank for a secure fit in all directions.

The SecureAll™ shall include a release handle which shall be integrated into the center of the bottom seat cushion for easy access and to eliminate hooking the release handle with clothing or other equipment.

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.

SEAT FRAME REAR FACING CENTER

The rear facing center seating shall include a seat frame which is located and installed behind the engine tunnel. The seat frame shall measure 40.75 inches wide X 12.00 inches high X 15.88 inches deep. The seat frame shall be constructed of 0.19 inch thick Marine Grade 5052-H32 smooth aluminum plate. The seat box shall be painted with the same color as the remaining interior.

SEAT FRAME REAR FACING CENTER STORAGE ACCESS

The rear facing center seat frame shall include a storage access opening which shall measure 32.00 inches wide X 8.75 inches high to allow access within the seat frame for storage. A solid access door shall be provided at the opening.

CAB FRONT UNDERSEAT STORAGE ACCESS

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

SEAT COMPARTMENT DOOR FINISH

All underseat storage compartment access doors shall have a multi-tone onyx black 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 aluminum with a chrome plated finish.

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

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

The exterior pull handles shall include a scuff plate behind the handle constructed of polished stainless steel to help protect the cab finish.

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 mirrors 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 in the left hand switch panel 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 on the dash in the switch panel.

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 5.00 inches wide made of SAE 304 polished stainless steel.

MUD FLAPS FRONT

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

CAB EXTERIOR FRONT & SIDE EMBLEMS

The cab shall include three (3) emblems. There shall be one (1) installed on the front air intake grille and one (1) emblem on each of the cab sides. The cab shall also include one (1) Advanced Protection System shield emblem on each front door.

IGNITION

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

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

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

BATTERY

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

BATTERY TRAY

The batteries shall be installed within two (2) 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 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 display shall be supplied. The battery conditioner display shall be mounted in the cab, viewable through the cab mid side window behind the left front door.

ELECTRICAL INLET LOCATION

An electrical inlet shall be installed on the left hand side of cab over the wheel well in the rearward 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 yellow cover.

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) marker lamps on the front of the vehicle designating identification and clearance. There shall be five (5) face mounted lights integrated into the scene light.

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.

LIGHTBAR SWITCH

The light bar shall be controlled by a rocker switch located on the switch panel. This switch shall be clearly labeled for identification.

INTERIOR OVERHEAD LIGHTS

The cab shall include a LED dome lamp located over each door. The lights shall include push switches on each lamp to activate both the clear and red portions of the light individually.

INTERIOR OVERHEAD LIGHTS ACTIVATION

The clear portion of each lamp shall be activated by opening the respective door.

LIGHTBAR PROVISION

There shall be one (1) light bar installed on the cab roof. The light bar 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

The cab shall be provided with one (1) Whelen model F4N72 light bar. The light bar shall be 72.00 inches in length and feature eighteen (18) customizable pods.

See the light bar layout for specific details. 12 red / 4 clear

FRONT SCENE LIGHTS

The front of the cab shall include one (1) Fire Research Crestline CLA100-A68 LED scene light installed on the brow of the cab. The light shall feature (5) five integrated marker lights with low beam and narrow flood optics. The light shall generate 17,800 lumens of light.

The housing and brackets 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.

FRONT SCENE LIGHTS ACTIVATION

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

SIDE SCENE LIGHTS

The side of the cab shall include two (2) Fire Research Spectra MAX model scene lights, one (1) each side, which shall be surface mounted.

Each lamp head shall have sixty (60) ultra-bright white LEDs, 56 for flood lighting and 4 to provide a spot light beam pattern. Each lamphead shall draw 13.8/6.9 amps, and generate 20,000 lumens of light. The lamphead shall have a unique lens that directs flood lighting onto the work area and focuses the spot light beam into the distance. Each lamp head shall be no more than 5.88 inches high by 14.50 inches wide and have a profile of less than 1.75 inches beyond the mounting surface and shall be powder coated and shall feature a chrome bezel.

SIDE SCENE LIGHT LOCATION

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

SIDE SCENE ACTIVATION

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

REAR SCENE LIGHTS

Fire Research Spectra LED Scene Light model SPA530-Q15-NS side mount push up telescopic light shall be installed. The light pole shall be anodized aluminum and have a knurled twist lock mechanism to secure the extension pole in position. The extension pole shall rotate 360 degrees. The outer pole shall be a grooved aluminum extrusion and qualify as an NFPA compliant handrail. The pole mounting brackets shall have a 3.50" offset. Wiring shall extend from the pole bottom with a 4' retractile cord.

The lamphead shall have sixty (60) ultra-bright white LEDs, 48 for flood lighting and 12 to provide a spot light beam pattern. It shall operate at 12/24 volts DC, draw 13/6.5 amps, and generate 15,000 lumens of light. The lamphead shall have a unique lens that directs flood lighting onto the work area and focuses the spot light beam into the distance. The lamphead angle of elevation shall be adjustable at a pivot in the mounting arm and the position locked with a round knurled locking knob. The lamphead shall be no more than 5.38" high by 14" wide by 3.75" deep and have a heat resistant handle. The lamphead and mounting arm shall be powder coated white. The LED scene light shall be for fire service use.

Fire Research Spectra –NS option no-scratch system shall be installed. The system shall include a guide collar installed on the push up pole and a guide rail and steady rest bracket mounted on the

apparatus. The guide collar and guide rail assembly shall be stainless steel and the steady rest cast aluminum.

The overall length of the assembly shall be approximately 68.00 inches and the light shall be mounted so in the stowed position the lamphead shall not protrude above the cab roof.

REAR SCENE LIGHT LOCATION

The rear scene lighting pole mounts shall be located on both the left and right corners of the rear wall. Each light shall be located approximately 2.50 inches from the center of the pole to the edge of the cab.

REAR SCENE LIGHT ACTIVATION

The rear scene lighting 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 TecNiq K50 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.

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 red.

OUTBOARD FRONT WARNING LIGHTS

The cab front fascia shall include two (2) Whelen 600 series Super LED Rota-Beam front warning lights in the left and right outboard positions. 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.

FRONT WARNING SWITCH

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

INTERSECTION WARNING LIGHTS

The chassis shall include two (2) Whelen 600 series Super LED Rota-Beam intersection warning lights, one (1) each side. The lights shall feature multiple flash.

INTERSECTION WARNING LIGHTS COLOR

The intersection lights shall be red.

INTERSECTION WARNING LIGHTS LOCATION

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

SIDE WARNING LIGHTS

The cab sides shall include two (2) Whelen 600 series Super LED Rota-Beam warning lights, one (1) on each side. The lights shall feature multiple flash patterns. 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.

SIDE WARNING LIGHTS 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) Whelen Strip-Light Plus XL tank lights surface mounted within a black bezel.

The light strips shall feature four (4) colors of LED lights to indicate the fluid level of a tank. The lights shall change in color to indicate the water level of the tank in ¼ tank increments, the colors shall change from green indicating a full tank to blue, amber, and red as the tank level drops.

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, behind the rear cab doors.

REAR WARNING LIGHTS

The cab shall be prewired and contain a cutout for a Whelen TACTL5 Traffic Advisor control head to be installed by the body builder. The prewire shall be coiled under the center dash panel.

Wiring provisions shall be provided routed to the rear of the frame for OEM installation of up to eight (8) individual traffic advisor warning lights rated at no more than one (1) amp each.

The power to the control head shall be ignition switched and activation dependent upon the state of the controllers switched position upon ignition.

SIREN CONTROL HEAD

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

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.

AUDIBLE WARNING LH FOOT SWITCH

A foot switch wired to actuate the mechanical siren(s) shall be supplied for installation in the front section of the cab for driver actuation.

MECHANICAL SIREN FOOT SWITCH LH

The mechanical siren foot switch shall be a Linemaster model 491-S.

MECHANICAL SIREN FOOT SWITCH LH LOCATION

The mechanical siren foot switch shall be located on the left hand side accessible to the driver between the steering column and the door.

MECHANICAL SIREN FOOT SWITCH LH POSITION

The mechanical siren foot switch shall be positioned outboard of any other foot switch, if applicable.

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.

AIR HORN AUXILIARY ACTIVATION

The air horn activation shall be accomplished by a single right hand side lanyard cable accessible to the officer. An air horn activation circuit shall be provided to the chassis harness pump panel harness connector.

MECHANICAL SIREN BRAKE/AUXILIARY ACTIVATION

The mechanical siren shall be actuated by two (2) dual function momentary rocker switches in the switch panel on the dash which shall activate the siren in the upper position and engage the siren brake in the lower position.

MECHANICAL SIREN INTERLOCK

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

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.

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.

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.

RADIO

A Jensen brand radio with weather band, AM/FM stereo receiver, rear RCA input pigtail connector, satellite radio capability, and a covered front auxiliary mini stereo input with iPod ready front and rear USB inputs shall be installed in a customer specified location.

RADIO LOCATION

The radio shall be installed in the left hand overhead position above the driver.

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.

RADIO SPEAKERS

There shall be two (2) speakers installed in the front portion of the cab recessed overhead and two (2) speakers installed on the upper rear wall of the cab. The speakers shall be provided for connection to the sound system.

CAMERA REAR

One (1) Audiovox Voyager heavy duty box shaped HD camera shall be shipped loose for OEM installation in the body to afford the driver a clear view to the rear of the vehicle.

The camera system shall include a one-way communication device that shall be an integral part of the rear camera for the use of voice commands directly to the driver. The rear camera display shall activate when the vehicle's transmission is placed in reverse.

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 chassis builder. 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 chassis builder supplied.

COMMUNICATION ANTENNA CABLE ROUTING

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

CAB EXTERIOR PROTECTION

The cab face shall have a removable plastic film installed over the painted surfaces to protect the paint finish during transport to the body manufacturer.

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 Advanced Protection System shall be available for free download from the Chassis website.

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

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

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

WARRANTY

Purchaser shall receive a Custom Chassis Two (2) Years or 36,000 Miles limited warranty in accordance with, and subject to, warranty certificate RFW0102. The warranty certificate is incorporated by reference into this proposal, and included with this proposal or available upon request.

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 one (1) digital copy of wiring schematics and option wiring diagrams.

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 or primary and secondary paint color as specified by the paint options.

CUSTOMER INSPECTION

There shall be a customer inspection for the chassis. The customer, the dealer, or the OEM shall be responsible for all travel costs and arrangements.

DRIVELINE LAYOUT CONFIRMATION

During the design phase of the chassis the 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.

EXHAUST MODIFICATION

The chassis exhaust pipe and muffler shall be extended to the front of the right rear wheel and shall be pointed out. Any heat shields required to protect body and/or compartments from heat shall be installed.

CHASSIS SETUP

The chassis shall have adjustments made to ensure the proper configuration for accepting pumps and/or bodies. This shall include the repositioning air tanks, frame cross members and miscellaneous adjustments.

CAB COMPARTMENT(S)

The cab shall include a compartment located in the center of the rear wall of the cab.

The compartment shall be located above the refrigerator and include side supports on each side of the refrigerator.

This compartment shall measure 38.00 inches high X 37.00 inches wide X 18.00 inches deep. The compartment shall be accessible from the interior of the cab through an ROM Series IV roll up style door.

The compartment shall include one (1) aluminum shelf which shall be secured using adjustable tracking on two (2) sides of the interior walls of the compartment. The shelf shall feature a 1.00-inch-tall lip around the edges.

The compartment(s) exterior shall be painted to match the cab interior.

REAR TOW EYES

There shall be two (2) rear tow eyes below the body that will be attached to the rear of the chassis frame.

PUMP OPERATOR'S PANEL - SIDE MOUNT

The operator's control panel shall be located on the left side of the apparatus. The upper portion of the panel will include the engine function and auxiliary gauges, gauge test panel, pump governor, discharge gauges for secondary discharge lines. It will be hinged to swing open, held at the end with appropriate fasteners.

The center portion of the panel will serve as a structural member and a guide for auxiliary discharge line controls.

The lower portion of the left panel will include all side discharge ports, gauges and drains, pony suction and main suction inlets, primer control and tank to pump lines.

The upper portion of the right pump panel will be a hinged door with an appropriate latch mechanism. This will allow for easy service access to the pump, primer oil reservoir and plumbing.

The lower portion of the right panel will include the right discharges, pony suction (if applicable) and the main suction inlet for the pump.

The valve control levers shall be of the horizontally operated locking type. Each lever shall have a chrome T-handle. The valve control levers shall be located directly adjacent to one another and mounted in line as to be in the same position when shut off. Each valve control lever shall be connected directly to it's respective valve by a rod to form a "direct linkage" control system. The specified pressure gauges shall be located adjacent to their respective discharge control levers. Each control shall be clearly marked by **color-coded** name plates permanently affixed to the operator's panel.

PUMP PANEL LAYOUT

All discharge valves, 1-1/2" and larger controlled at the operator's control panel shall have corresponding pressure gauges. Gauges shall be 2-1/2" in diameter, 0-400 PSI graduated, silicone filled.

The apparatus body and pump panel modules shall be constructed as independent structures to allow body flexing and to prevent fatigue from normal chassis movement. There shall be a 1" wide gasket installed between the body and the pump panel module.

The front of the pump module shall be enclosed with aluminum diamond plate.

PUMP PANELS AND DOORS

The pump panels and pump access doors shall be constructed of black coated aluminum.

SIDE MOUNT FIRE PUMP MODULE INSTALLATION

The fire pump, pump assembly, plumbing, intakes, outlets, and accessories shall be installed on the chassis.

LEFT PUMP PANEL LIGHT

The left pump panel shall be lit with LED strip lighting. Each strip light shall be mounted under a formed light shield. The lights will be controlled by the parking brake switch.

RIGHT PUMP PANEL LIGHT

The right pump panel shall be lit with LED strip lighting. Each strip light shall be mounted under a formed light shield. The lights will be controlled by the parking brake switch.

COLOR CODED PUMP PANEL

All valve controls, discharges and drains shall be labeled and color coded to the customer's specifications.

SINGLE STAGE FIRE PUMP

The pump shall be a Hale QMAX-XS 1500 gpm.

At time of delivery pump shall be tested and rated as follows:

- 100% of rated capacity at 150 pounds net pressure.
- 100% or rated capacity at 165 pounds net pressure.
- 70% of rated capacity at 200 pounds net pressure.
- 50% of rated capacity at 250 pounds net pressure.

The entire pump shall be cast, manufactured, and tested at the pump manufacturer's factory.

The pump shall be driven by a drive line from the truck transmission. 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 spots as outlined by the latest NFPA Pamphlet No. 1901. Pump shall be free from objectionable pulsation and vibration.

The pump body and related parts shall be of fine grain alloy cast iron, with minimum tensile strength of 30,000 psi. All moving parts in contact with water shall be of high quality bronze or stainless steel.

The 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.

The pump shall have one double suction impeller. The pump body shall have two opposed discharge volute cutwaters to eliminate radial unbalance.

Pump shaft to be rigidly supported by three bearings for minimum deflection. One high lead bronze sleeve bearing shall be located immediately adjacent to the impeller on side opposite the gearbox. 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 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 wraparound 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 protection (zinc foil separators in packing) for longer shaft life. Pump shaft must be sealed with double-lip oil seal to keep road dirt and water out of gearbox.

PUMP TRANSMISSION

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

Pump transmission shall be of sufficient size to withstand up to 16,000 lbs. Ft. of 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.

The transmission drive shafts shall be of heat-treated chrome nickel steel and at least 2 3/4 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 capability. An accurately cut spur design shall be provided to eliminate all possible end thrust.

FIRE PUMP WARRANTY - FIVE YEARS

The fire pump shall carry the pump manufacturer's five (5) year warranty covering defective parts and workmanship. A copy of the pump manufacturer's warranty policy shall be provided with the completed apparatus. The warranty shall cover parts for five (5) years and labor for two (2) years.

MECHANICAL SEAL

The pump shall include a mechanical seal.

AKRON VALVES

All suction and discharge valves, including tank to pump lines, will be AKRON brand.

U. L. TEST PLUGS

Two U. L. test plugs shall be pump panel mounted for UL testing of vacuum and pressures.

U. L. TEST - 1500 GPM

The pump will meet and perform the following test to receive a U. L. certification.

- 100% of rated capacity at 150 PSI net pump pressure.
- 100% of rated capacity at 165 PSI net pump pressure.
- 75% of rated capacity at 200 PSI net pump pressure.
- 50% of rated capacity at 250 PSI net pump pressure.

PUMP ANODES

Three (3) sacrificial anodes shall be installed in the pump as follows:

- Intake manifold - two (2)
- Discharge manifold - one (1)

The anodes shall be drilled to indicate that they should be replaced when they leak.

FIRE PUMP PRIMING SYSTEM

A Trident Model #31.001.(x) 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 direct connection to the Hale fire pump. The primer shall automatically drain when the panel control actuator is not in operation. The connection to the pump shall have an integral Hale strainer.

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.

Warranty

The primer shall be covered by a five (5) year parts warranty.

ENGINE COOLER

An engine cooler shall be installed inline with the discharge side of the pump. Coolant inlet and outlet shall be continuous, preventing intermixing of engine coolant and pump water.

PUMP COOLER

A pump cooler recirculating line and valve shall be installed. It shall be connected to the discharge side of pump to a valve located on pump panel and back to inlet side of pump.

PUMPHOUSE HEATER

A pump house 25,000 BTU heater will be installed behind the pump panel. It will provide warm air flow via forced air, fed from the vehicle cooling system. A fan motor will be installed, switched from the pump panel.

Two valves will be provided in the lines to allow the system to be shut off during warm weather operations.

EVACUATION HORN

There shall be an air horn switch installed on the pump panel that shall activate the chassis air horns.

PUMP SHIFT

A power shift shall be installed in a convenient location to engage fire pump. Two indicator lights located next to the pump shift controls shall be installed. One shall indicate that the pump shift has been successfully completed. The other will indicate that the pump is engaged, the chassis transmission is in pump gear, and the parking brake is engaged.

A "Throttle Ready" indicator light shall be provided at the pump operator's panel that indicates the apparatus is in "OK to Pump" mode.

PUMP SHIFT INDICATOR

A green light to indicate that the pump is in gear shall be mounted on the cab dash and on the pump panel.

PUMP SHIFT OVERRIDE

There shall be a manual pump shift installed on forward side of pump gearbox that will enable the pump to be manually placed into pump mode.

PRESSURE GOVERNOR

The apparatus shall be equipped with the Class1 UV Total Pressure Governor System. The UV Total Pressure Governor System (SPGS) is a J1939 CAN based pressure governing system that consists of a UV-TPG display, Twister throttle, pressure transducers and associated wiring. The UV-TPG must be capable of dual station control allowing the system to be operated from separate locations on the apparatus (dual systems do not require additional transducers). The UV-TPG advanced diagnostic capability instantly notifies the operators of any out of parameter condition. It also notifies the operator of actions performed and suggests operation methods in the event of an out of parameter condition. Graphic diagnostics also provides wiring and troubleshooting information.

The UV-TPG display utilizes Class1's UltraView technology. It is a custom tooled and programmed, 4.3 inch, full color LCD display with an (8) buttons. It shall be bonded for direct sunlight viewing. The UV-TPG is sealed to IP67 and allows for flush, pedestal or rear mounting options. The UV-TPG display can be oriented in either the portrait or landscape orientations. The UV-TPG display provides the interface to the Engine Control Module (ECM) mounted on the engine. The UV-TPG display will operate as a pressure sensing governor (PSG) utilizing the engines J1939 CAN data for optimal resolution and response. If J-1939 engine control is not supported by the engine manufacturer, then analog remote throttle control shall be provided by the UV-TPG display. The UV-TPG display utilizes control algorithms that minimize pressure spikes during low or erratic NTwater supply situations. The UV-TPG display shall be backwards compatible to any engine that supplies J1939 RPM, Temperature and Oil Pressure information providing the ability to maintain a consistent fleet fire-fighting capability

and reduce operator cross training and confusion. The UV-TPG display shall have the ability to use either a 300 PSI or 600 PSI pressure transducers for discharge pressure.

The UV-TPG display is capable of storing up to 12 different languages. It shall provide the operator with the ability to adjust the display brightness for day and night mode operations. The following parameters visible at all times:

- Pump Discharge Pressure
- Engine RPM
- Engine Oil Pressure
- Engine Coolant Temperature
- Transmission Temperature
- System Voltage
- Throttle Ready Interlock Status
- Pump Engaged Interlock Status
- OKAY to Pump Interlock Status
- Operating Mode Status (RPM or Pressure)
- Target Pressure Indication (when in pressure mode)

Twister Throttle

The Twister throttle is a J1939 CAN based throttle device that communicates directly with the UV-TPG display. It features a robust knob operator that can be configured to operate the engine throttle in either the clock wise or counter clockwise directions. It features a large stationary idle button in the center of the knob. It also provides the operator with “Throttle Ready” and “Throttle Active” LED indicators. The Twister throttle can be mounted away from the UV-TPG Display giving the operator hand control at waist level. This also allows the UV-TPG display to be mounted at eye level assuring that the operator has the most comfortable and ergonomic control possible.

FOAM PROPORTIONING SYSTEM - FOAMPRO 2001

1. The apparatus shall be equipped with an electronic, fully automatic, variable speed, direct injection, discharge side foam proportioning system. The system shall be capable of handling Class A foam concentrates. The foam proportioning operation shall be based on direct measurement of water flows, and remain consistent within the specified flows and pressures. The system shall be equipped with a digital electronic control display, suitable for installation on the pump panel. Incorporated within the control display shall be a microprocessor that receives input from the system flow meter, while also monitoring foam concentrate pump output, comparing values to ensure that the operator preset proportional amount of foam concentrate is injected into the discharge side of the fire pump.

2. A paddlewheel type flow meter shall be installed in the foam manifold.

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

a). Provide push-button control of foam proportioning rates from 0.1% to 3.0%, in 0.1% increments.

b). Show current flow-per-minute of water.

c). Show total volume of water discharged during and after foam operations are completed.

d). Show total amount of foam concentrate consumed.

e). Simulate flow rates for manual operation.

f). Perform setup and diagnostic functions for the computer control microprocessor.

g). Flash a "low concentrate" warning when the foam concentrate tank runs low.

h). Flash a "no concentrate" warning and shut the foam concentrate pump off, preventing damage to the pump, should the foam tank empty.

4. A 12-volt electric motor driven positive displacement foam concentrate pump, rated up to 3.0 GPM, with operating pressures up to 400 psi (28 BAR), shall be installed in a suitable compartment near the apparatus pump house. A pump motor electronic driver (mounted to the base of the pump) shall receive signals from the computer control display and power the 1/2 hp electric motor directly coupled to the concentrate pump in a variable speed duty cycle to ensure that the correct proportion of concentrate preset by the pump operator is injected into the water system.

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

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

a). Operator control and display

b). Paddlewheel flow meter

c). Pump and electric motor/motor driver

d). Wiring harnesses

e). Low level tank switch

f). Foam tank

h). Foam injection check valve

7. Installation and operation manual shall be provided for the unit, along with a one-year limited warranty by the manufacturer.

STAINLESS PLUMBING

All plumbing shall be either stainless steel or high pressure hose with crimped stainless steel fittings. Any manifolds shall be stainless steel. All valves shall be bronze or stainless steel unless other specified.

STAINLESS PLUMBING WARRANTY - TEN YEARS

The manufacturer warrants to the original purchaser all stainless steel plumbing components installed by them and used in the construction of the apparatus water / foam plumbing systems against defects in workmanship and materials for a period of ten (10) years from delivery.

TANK TO PUMP

A 4" full flow valve shall be installed between the tank and pump suction. The valve shall be air operated with the control mounted on the pump panel.

MASTER PUMP DRAIN

The master drain shall have the capacity to drain all lines and main pump at the same time. The master drain will be mounted on the pump panel and will be readily accessible.

LINE DRAINS

All suction and discharge lines (1-1/2" and larger) shall have a lever action quarter turn drain valve installed. Each drain valve shall be arranged adjacent to the valve or in a convenient location on the left and/or right pump panel. Remote drain lines will be clearly marked with color coded tags.

INTAKE RELIEF VALVE

A stainless steel suction relief valve will be installed on the suction port of the main fire pump. The valve will be adjustable from 75-250 PSI. The valve will terminate at a 2-1/2" NST-M flange; a cap will be available for emergency use.

PUMP TO TANK LINE

There shall be a 2" pump to tank fill line installed with a 2" inline valve. The valve shall be controlled from the pump panel.

1-3/4" FRONT JUMP LINE

There shall be a 2" jump line installed with a 2" inline valve. The valve shall be controlled at the pump panel. The rigid piping will be stainless steel with flexible high pressure hydraulic hose lines using stainless steel fittings. There will be a 2" swivel elbow with 1-1/2" NST threads.

The discharge shall be foam capable.

JUMPLINE SWIVEL

The front jumpline swivel will be installed inside the front hosewell.

FRONT BUMPER DISCHARGE DRAIN

The front bumper jumpline shall include an auto drain.

6" STEAMER INLETS (2)

Two (2) 6" steamer inlets will be provided, one (1) left side and one (1) on right side.

HIGH FLOW BALL INTAKE VALVE

A TFT Ball Intake Valve (BIV) shall be provided and installed on the left side steamer inlet of the pump.

Task Force Tips model #AQ8NT-NX manually operated lightweight aluminum high flow straight inlet ball intake valve shall be provided. The unit shall be equipped with a blank plate under the main valve body where an adjustable pressure relief valve may be added. The valve shall be controlled with an NFPA compliant slow-close hand wheel gear operator which can be configured for left or right hand operation. A 3/4" bleeder valve shall be provided to exhaust excess air or water from the valve and hoseline. A position indicator shall be provided to allow for quick visualization of the status of the valve in the open, closed or partial positions. For maximum corrosion protection the aluminum casting shall be hardcoat anodized, with a powder coat internal and external finish and all components typically facing the wet side of the valve shall be constructed from hard coat anodized aluminum alloy with corrosion resistant coating.

The connections shall be: 5" male NH rigid and a 6" female NH swivel long handle and include polymer bearing strips for prevention of galvanic corrosion. The unit shall have a unique serial number. The valve shall be covered by a 10-year warranty against manufacturing defects and corrosion that affect the valve's operational performance.

HIGH FLOW BALL INTAKE VALVE

A TFT Ball Intake Valve (BIV) shall be provided and installed on the right side steamer inlet of the pump.

Task Force Tips model #AX1ST-NX manually operated lightweight aluminum high flow ball intake valve shall be provided. The unit shall be equipped with an adjustable pressure relief valve under the main valve body with an eight position adjustable inlet elbow. The valve shall be controlled with an NFPA compliant slow-close hand wheel gear operator which can be configured for left or right hand operation. A 3/4" bleeder valve shall be provided to exhaust excess air or water from the valve and hoseline. A position indicator shall be provided to allow for quick visualization of the status of the valve in the open, closed or partial positions. For maximum corrosion protection the aluminum casting shall be hardcoat anodized, with a powder coat internal and external finish and all components facing the wet side of the valve shall be constructed from stainless steel.

The connections shall be: 5" Storz rigid with 30 degree swiveling detent elbow and a 6" female NH swivel long handle connection and include polymer bearing strips for prevention of galvanic corrosion. The Storz coupling shall be easily configurable as swivel or rigid with a tool. The unit shall have a unique serial number and be covered by a five-year warranty.

LEFT 2-1/2" SUCTION INTAKE

A 2-1/2" ball-type suction valve shall be installed on the left side pump panel with the valve body mounted behind the pump panel. The control shall be a fixed pivot design, with the handle located along side the suction valve.

The suction valve shall come equipped with a chrome plug, chain, brass inlet strainer and a 2-1/2" NST chrome inlet swivel.

RIGHT 2-1/2" SUCTION INTAKE

A 2-1/2" ball-type suction valve shall be installed on the right side pump panel with the valve body mounted behind the pump panel. The control shall be a fixed pivot design, with the handle located along side the suction valve.

The suction valve shall come equipped with a chrome plug, chain, brass inlet strainer and a 2-1/2" NST chrome inlet swivel.

LEFT 2-1/2" DISCHARGES (2)

Two (2) 2-1/2" discharge shall be located on the left side pump panel. The valve shall be a quarter turn ball type and fixed pivot design to allow easy operation at all pump pressures, and operated from the panel. The threads on the valve shall be 2-1/2" NST. The discharge shall come equipped with a 3/4" drain valve.

DISCHARGE ADAPTER

A chrome elbow, cap and chain shall be supplied with the discharge(s).

RIGHT 2-1/2" DISCHARGE (1)

One (1) 2-1/2" discharge shall be located on the right side pump panel. The valve shall be a quarter turn ball type and fixed pivot design to allow easy operation at all pump pressures, and operated from the panel. The threads on the valve shall be 2-1/2" NST. The discharge shall come equipped with a 3/4" drain valve.

DISCHARGE ADAPTER

A chrome elbow, cap and chain shall be supplied with the discharge(s).

4" RIGHT PANEL LD DISCHARGE - 3" VALVE

There shall be a 4" discharge on the right pump panel. The discharge shall be piped to the discharge side of the pump through a 3" valve that shall be pump panel controlled. A 3/4" quarter turn drain valve shall be installed.

DISCHARGE ELBOW

The following elbow shall be supplied for the discharge(s):

4" NH-F swivel x 5" storz w/ cap

DECK GUN DISCHARGE - 3"

There shall be a 3" deck gun discharge pipe installed above the pump compartment. The discharge shall be controlled by a 3" inline valve. The valve shall be a quarter turn ball type of fixed pivot design and constructed of bronze. The discharge control handle shall be a handle type located on the pump panel. The discharge shall terminate with a 4-bolt flange.

SLO-CLOSE VALVES

A SLO-CLOSE feature will be installed on all valves over 2-1/2" in size as directed by NFPA. These valves will allow full open and close functions without water hammer.

PORTABLE MONITOR TOP AND EXTEND-A-GUN PACKAGE

Task Force Tips Crossfire model # XFC-72 portable lightweight monitor package consisting of monitor top, stacked tips, stream straightener, Extend-A-Gun, and installation bracket set shall be supplied.

Task Force Tips Crossfire, model portable monitor top shall be provided. This top only portion with quick release swivel joint shall be designed for use on truck mounted risers and TFT Safe-Tak 1250 series portable bases. The monitor shall include safety devices that include a locking button which locks the quick release lever when monitor is pressurized, and a 1/4 turn rotational lever lock that secures the horizontal rotation and provides a visual indication that the monitor rotation is locked. For corrosion resistance the monitor shall be constructed from hardcoat anodized aluminum with a red powder coat interior and exterior finish.

The monitor shall have a 3-1/4" waterway for delivery of up to 1250 GPM with low friction loss. Vertical elevation shall be controlled through use of a handwheel controlled stainless steel worm gear which allows full travel to the safety stop point of 35 degrees above horizontal with seven rotations of the wheel. When positioned on a truck mounted riser the monitor shall be able to be used below the 35 degree stop point through release of the spring loaded safety pin. An automatic drain to remove remaining water and avoid freezing shall be included. Integral stream straightener and pressure gauge shall be included.

Task Force Tips smooth bore stacked tip set shall be provided. For corrosion resistance the tip set shall be constructed from hardcoat anodized aluminum alloy. The set shall consist of four (4) tips with the base tip having a 2-1/2" female NH swivel inlet and 2" outlet. The other tip sizes shall be 1-3/4", 1-1/2" and 1-3/8". Each tip shall be laser engraved with a flow/pressure chart, orifice size, and thread size.

Task Force Tips stream straightener shall be supplied. The straightener shall be constructed from extruded aluminum with internal vanes designed to reduce turbulence and increase the reach of smooth bore water streams. The device shall have 2-1/2" female NH rigid inlet and 2-1/2" male NH rigid outlet.

Task Force Tips manually telescoping waterway shall be installed. The waterway shall be capable of being lowered to deck level (or into a monitor well) for storage and transportation and shall be capable of being raised to an extended height by lifting a quick release latch located at the base of the extension tube. This latching device shall be capable of locking the waterway in either the raised or lowered position while maintaining the ability to horizontally rotate the monitor device 360 degrees.

A sensor shall be located on the waterway that signals a 12 volt indicator light installed in the cab to illuminate to indicate that the monitor is raised. The aluminum riser shall have a 3" waterway; hardcoat anodized finish and be furnished with a 3" inlet and a Task Force Tips Crossfire coupling outlet.

Task Force Tips bracket set shall be installed. The set shall be designed to securely mount the Extend-A-Gun telescoping waterway. The primary components shall have unique serial numbers and all components shall be covered by a five-year warranty.

1-3/4" CROSSLAY HOSEBED (2)

Two (2) 1-3/4" crosslays shall be installed on top of the pump house. Each section of the crosslay shall hold 200' of 1-3/4" double jacket fire hose. A 2" mechanical swivel hose connector shall be used in each crosslay to provide access of hose in either direction.

Each crosslay shall have one 2" valve which shall be controlled with a quarter turn locking handle mounted on the pump panel.

The discharges shall be foam capable.

CROSSLAY HOSEBED COVER

There shall be an aluminum cover for the crosslays. The cover shall be constructed of 1/8" aluminum tread plate and be hinged with a stainless steel knuckle hinge. The cover shall open from the front of the body and swing up to the rear of the body.

CROSSLAY FLAPS

Side flaps for crosslays constructed of 22 ounce hypalon shall be installed to retain hose in the pre-connected beds per NFPA requirements.

2-1/2" REAR DISCHARGE

A 2-1/2" rear discharge shall be provided using a 2-1/2" stainless steel pipe with a chrome 2-1/2" male NST adapter on the outside end. Rear discharge shall be operated by a 2-1/2" valve with T-handle controls on the pump panel. Discharge shall have a 3/4" drain valve.

DISCHARGE ADAPTER

A chrome elbow, cap and chain shall be supplied with the discharge(s).

REAR DISCHARGE SLEEVE

A 4" diameter special pass-through sleeve shall be installed in the tank for the installation of a rear discharge.

TANK FILL - 2-1/2" FIREMAN'S FRIEND - REAR

There shall be a 2-1/2" Fireman's Friend semi-automatic fill valve with 2-1/2" NPT-F fitting installed at the rear of the apparatus. The valve is a stainless steel internally mounted check-type fill valve. Inlet adapters are not included with this item.

FIREMANS FRIEND WARNING PLATE

A permanent plate shall be installed near the fireman's friend indicating "DO NOT EXCEED 100 PSI".

FAST FILL DIFFUSER

A fast fill fitting with a diffuser shall be installed in the water tank.

ADAPTER

The following adapter shall be supplied for the rear tank fill:

2-1/2" NPT-M x 2-1/2" NH-F swivel

ELBOW

The following elbow shall be supplied for the rear tank fill:

2-1/2" NH-M x 2-1/2" NH-F with plug

DISCHARGE PRESSURE GAUGES

Each discharge shall include a 2-1/2" silicone filled gauge that will have a 316 stainless steel bezel. The gauge face will be white and have black markings. The gauge will read 0 to 400lb and will be accurate to within 1%. The gauge shall be located on the pump panel and placed in a well lighted position for night apparatus operation.

POLYPROPYLENE WATER TANK

The booster tank shall have a capacity of 1000 US gallons.

CONSTRUCTION:

The water tank shall be constructed of polypropylene or Polyrene sheet stock. This material shall be a non-corrosive thermo plastic.

The booster and/or foam tank shall be of a specific configuration and is so designed to be built as part of the body. The tank shall be constructed utilizing latest thermo plastic welding technology. The tank shall undergo extensive testing prior to installation in the truck. In addition, the completed tank shall be water pressure tested. Baffles, both longitudinal and latitudinal shall be interlocking and thermo welded to minimize water surge during travel, enhancing road handling stability. Openings in the baffles shall be positioned to allow water flow to NFPA standards during filling or pumping operations. The tank shall be mounted on hard rubber cushions to isolate the tank from road shock and vibrations. The tank shall be mounted according to manufactures recommendations. A lifetime manufacturer's statement of Warranty shall warrant each tank to be free from manufacturing defects in material and workmanship for the service life of the vehicle.

FILL TOWER AND COVER:

The tank shall have a combination vent and manual fill tower. The tower shall be located in the left front corner of the tank unless otherwise specified by the customer. The tower shall have a 1/4" thick removable polypropylene screen and a hinged cover. Inside the fill tower approximately 4" down from the top shall be fastened 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 behind the rear wheels to maximize traction.

SUMP:

There shall be one (1) sump standard per tank. On tanks that require front suction, 4" schedule 40 polypropylene pipe shall be installed that will incorporate a dip tube from the front of the tank to the sump location. The sump shall have a minimum 3" NPT threaded inlet on the bottom for a drain plug. This shall be used as a combination clean out and drain.

OUTLETS:

There will be two (2) standard tank outlets: One for tank to pump suction line which shall be a minimum of 3" NPT coupling; and One for a tank fill line which shall be a minimum of 2" NPT coupling. All tank fill couplings shall be backed with flow deflectors to break up the stream of water entering the tank.

DESIGN:

The tank shall be designed to include the body, compartments, hosebed, storage sleeves and any upper body compartments. The entire body, hosebed, tank and upper body storage shall be able to be removed with one set of lifting eyes.

POLYPROPYLENE TANK WARRANTY - LIFETIME

The water tank manufacturer shall warrant the booster/foam tank to be free from manufacturing defects in material and workmanship for the service life of the vehicle. The tank must be installed in accordance with tank manufacturer's installation recommendations.

A copy of the tank manufacturer's warranty, including terms and limitations will be provided upon delivery of the completed apparatus.

WATER TANK LEVEL GAUGE

A blue LED Class 1 water tank level display shall be installed on the pump panel. A single transducer will be installed in the water tank. A built-in calibration system allows this unit to be used with any tank configuration or material. A 10 foot harness is standard. The display includes 40 LED lights visible from 180 degrees.

WATER TANK LEVEL GAUGE

There shall be a Whelen PSTANK2 water level LED strip light(s) provided and installed. The light has four LED panels of different colors and operates off the master water level gauge.

Location(s): Rear of Body, Two (2) shall be cab supplied

TANK LEVEL GAUGE DRIVER

A Class 1 4 light tank level driver module shall be installed for the additional tank level gauges.

HOSEBED

The hose body will be constructed co-polymer polypropylene. 1/8" (.125) 3003 H-14 smooth aluminum will be installed as a drip cap on top of the body sides. The hose compartment floor will be constructed from a ribbed co-polymer polypropylene. The hose body floor ends will be slotted to allow for infinite adjustment of the hose bed dividers. The hosebed floor shall be constructed as part of the tank.

The hosebed shall include an open walkway running from the front of the body to the rear of the apparatus for safely loading and unloading equipment and hose. The width of the walkway shall be determined by the hose capacity storage.

Minimum Hose Capacity: 500' of 5", 800' of 2-1/2"

HOSEBED COVER

A 22 oz. hose bed cover shall be provided. The cover shall be fire retardant Hypalon material and installed over the hose bed. The cover shall have bungee straps along the sides and awning track on the front edge. The end of the hose bed cover shall be weighted and cover hose bed opening.

The hosebed cover shall be red.

HOSEBED DIVIDERS

Two (2) hose bed dividers manufactured from 3/16" smooth aluminum plate with an extruded aluminum base welded to the bottom shall be provided. The dividers shall have an extruded track to slide in to allow the hose bed to be adjusted for different hose capacities. One end of each divider shall have a 3" radius corner with a hand hole cutout provided. The dividers shall be sanded as to prevent damage to hose.

BODY CONSTRUCTION

The apparatus body shall be constructed of either stainless steel or poly.

EXTRUDED ALUMINUM BODY SUPERSTRUCTURE

The body subframe is to be entirely welded, constructed of 6061-T6 extruded aluminum tubing with **minimum** dimensions of 2"x3"x1/4". All vertical components are to be reinforced to the substructure with 2"x2"x1/4" 6061-T6 TUBULAR gussets at strategic points to assure structural integrity.

The body sides are to be supported by 2"x2"x1/4" 6061-T6 structural aluminum tubing welded to form a continuous support matrix for the hose body and compartments.

The tank cradle will be designed to support the bottom of the water tank to prevent movement and structural damage when the unit is loaded and under motion. Reinforced rubber pads with a 60# rating will be installed in the cradle and at the corner angles to cushion the tank; no mechanical attaching devices will protrude through the rubber.

Fender liners will be independent from the compartment sides to provide maximum corrosion and impact protection. Aluminum fenderettes are to be easily removable.

The apparatus body shall be entirely independent from the chassis frame. It is to be attached to the frame over 1/2" x 3" 60# rubber pads running the full length of body. The unit is to be designed so as to be removable from the chassis in the event of future chassis replacement.

POLY APPARATUS BODY

The 100" wide apparatus body is to be constructed from a co-polymer material with 1/2" to 1" material. The tank, body and compartments shall be fabricated as one unit. The compartment floors shall be supported by structure off of the aluminum subframe.

COMPARTMENTATION:

Each compartment shall be "sweep-out" style. The compartments shall be divided as follows:

SIDE:

There shall be two (2) compartments ahead of the rear wheels, one (1) each side. The compartments shall be approximately **48" wide x 70" high x 26/16" deep**.

There shall be two (2) compartments over the rear wheels, one (1) each side. The compartments will be approximately **58" wide x 36" high x 16" deep**.

There shall be two (2) compartments behind the rear wheels, one (1) each side. The compartments shall be approximately **40" wide x 70" high x 26/16" deep**.

REAR:

There shall be one (1) compartment in the rear of the apparatus. The compartment shall be approximately **30" wide x 66" high x 26/14" deep**.

L1 COMPARTMENT

- *The following is a description of items included with the compartment.*

ROLL UP DOOR - BRUSHED

ROM series 4 roll-up door will be installed in this compartment. The shutters will be constructed from extruded aluminum with a brushed finish. Internally sealed for weather resistance and quiet operation. Rubber seals will be installed on the vertical components. The door will close/lock with a combination handle/locking bar on the exterior at the bottom.

The door will roll-up in the top of the compartment to allow for maximum use of the compartment interior.
Lighting will be located on the vertical compartment walls for maximum effectiveness.

ROLL UP DOOR SILLS

An extruded aluminum door sill shall be provided for each roll up door.

DOOR STRAP

An elastic door strap shall be installed on this compartment door to assist in lowering the door.

ADJUSTABLE TRACKING

There shall be tracking installed in the compartment to accommodate the installation of air pack brackets and/or equipment. The tracks shall be installed horizontally on the back wall of the compartment.

ROLL OUT TRAY - FLOOR MOUNTED

A Slide-Master aluminum heavy duty 100% roll-out tray with a minimum capacity of 700# shall be provided and installed on the compartment floor. The tray shall be constructed of 3/16" aluminum with a 2" lip on each side. The roll-out mechanism shall include a push/pull spring lock for the full open and closed positions.

VERTICAL COMPARTMENT DIVIDER ON ROLL OUT TRAY

A bolt in vertical compartment divider fabricated from 3/16" aluminum shall be provided and installed on the compartment roll-out tray.

The divider will be mounted to adjustable tracking to allow for side to side adjustment.

BACKWALL TOOLBOARD

A toolboard will be installed on the compartment upper back wall. The partition shall be made from 3/4" thick co-polymer material.

SCBA BRACKET

One (1) Ziamatic model #UN-6-30-2-SFPHS air pack bracket shall be supplied and mounted in the compartment.

Location: Back wall toolboard

STRAINER MOUNT

A mount for a low level strainer shall be provided and installed below the shall depth portion of the compartment.

DRI-DECK MATTING - ROLL OUT TRAY

The surface of one (1) tray shall be covered with black Dri-Deck mat.

LED COMPARTMENT LIGHTS

Two (2) extruded aluminum LED strip lights shall be installed in the compartment. The strip lights shall be installed in a vertical position and run the full height of the compartment, one (1) each side.

L2 COMPARTMENT

- *The following is a description of items included with the compartment.*

ROLL UP DOOR - BRUSHED

ROM series 4 roll-up door will be installed in this compartment. The shutters will be constructed from extruded aluminum with a brushed finish. Internally sealed for weather resistance and quiet operation. Rubber seals will be installed on the vertical components. The door will close/lock with a combination handle/locking bar on the exterior at the bottom.

The door will roll-up in the top of the compartment to allow for maximum use of the compartment interior.
Lighting will be located on the vertical compartment walls for maximum effectiveness.

ROLL UP DOOR SILLS

An extruded aluminum door sill shall be provided for each roll up door.

DOOR STRAP

An elastic door strap shall be installed on this compartment door to assist in lowering the door.

ADJUSTABLE SHELF TRACKING

There shall be tracking installed in one (1) compartment to accommodate the installation of adjustable shelves and/or roll-outs. The tracks shall be installed vertically on the walls of the compartment.

ADJUSTABLE TRACKING

There shall be tracking installed in the compartment to accommodate the installation of air pack brackets and/or equipment. The tracks shall be installed horizontally on the back wall of the compartment.

ADJUSTABLE SHELF- SHALLOW DEPTH

There shall be an adjustable shelf made from 3/16" aluminum with 2" sides provided and installed on the adjustable tracking.

BACKWALL TOOLBOARD

A toolboard will be installed on the compartment upper back wall. The partition shall be made from 3/4" thick co-polymer material.

DRI-DECK MATTING - COMPARTMENT FLOOR

The surface of the compartment floor shall be covered with black Dri-Deck mat.

DRI-DECK MATTING - ADJUSTABLE SHELF

The surface of one (1) shelf shall be covered with black Dri-Deck mat.

LED COMPARTMENT LIGHTS

Two (2) extruded aluminum LED strip lights shall be installed in the compartment. The strip lights shall be installed in a vertical position and run the full height of the compartment, one (1) each side.

L3 COMPARTMENT

The following is a description of items included with the compartment.

ROLL UP DOOR - BRUSHED

ROM series 4 roll-up door will be installed in this compartment. The shutters will be constructed from extruded aluminum with a brushed finish. Internally sealed for weather resistance and quiet operation. Rubber seals will be installed on the vertical components. The door will close/lock with a combination handle/locking bar on the exterior at the bottom.

The door will roll-up in the top of the compartment to allow for maximum use of the compartment interior.
Lighting will be located on the vertical compartment walls for maximum effectiveness.

ROLL UP DOOR SILLS

An extruded aluminum door sill shall be provided for each roll up door.

DOOR STRAP

An elastic door strap shall be installed on this compartment door to assist in lowering the door.

ADJUSTABLE SHELF TRACKING

There shall be tracking installed in one (1) compartment to accommodate the installation of adjustable shelves and/or roll-outs. The tracks shall be installed vertically on the walls of the compartment.

ADJUSTABLE TRACKING

There shall be tracking installed in the compartment to accommodate the installation of air pack brackets and/or equipment. The tracks shall be installed horizontally on the back wall of the compartment.

ADJUSTABLE SHELF- SHALLOW DEPTH

There shall be an adjustable shelf made from 3/16" aluminum with 2" sides provided and installed on the adjustable tracking.

ROLL OUT TRAY - FLOOR MOUNTED

A Slide-Master aluminum heavy duty 100% roll-out tray with a minimum capacity of 700# shall be provided and installed on the compartment floor. The tray shall be constructed of 3/16" aluminum with a 2" lip on each side. The roll-out mechanism shall include a push/pull spring lock for the full open and closed positions.

EXTINGUISHER MOUNTS

Four (4) extinguisher brackets shall be supplied and mounted in the compartment on the roll-out tray.

DRI-DECK MATTING - ADJUSTABLE SHELF

The surface of one (1) shelf shall be covered with black Dri-Deck mat.

DRI-DECK MATTING - ROLL OUT TRAY

The surface of one (1) tray shall be covered with black Dri-Deck mat.

LED COMPARTMENT LIGHTS

Two (2) extruded aluminum LED strip lights shall be installed in the compartment. The strip lights shall be installed in a vertical position and run the full height of the compartment, one (1) each side.

REAR COMPARTMENT

The following is a description of items included with the compartment.

ROLL UP DOOR - BRUSHED

ROM series 4 roll-up door will be installed in this compartment. The shutters will be constructed from extruded aluminum with a brushed finish. Internally sealed for weather resistance and quiet operation. Rubber seals will be installed on the vertical components. The door will close/lock with a combination handle/locking bar on the exterior at the bottom.

The door will roll-up in the top of the compartment to allow for maximum use of the compartment interior.
Lighting will be located on the vertical compartment walls for maximum effectiveness.

ROLL UP DOOR SILLS

An extruded aluminum door sill shall be provided for each roll up door.

DOOR STRAP

An elastic door strap shall be installed on this compartment door to assist in lowering the door.

ROLL OUT TRAY - FLOOR MOUNTED

A Slide-Master aluminum heavy duty 100% roll-out tray with a minimum capacity of 700# shall be provided and installed on the compartment floor. The tray shall be constructed of 3/16" aluminum with a 2" lip on each side. The roll-out mechanism shall include a push/pull spring lock for the full open and closed positions.

VERTICAL COMPARTMENT DIVIDERS ON ROLL-OUT TRAY

Three (3) bolt in vertical compartment dividers fabricated from 3/16" aluminum shall be provided and installed on the compartment roll-out tray.

The dividers will be mounted to adjustable tracking to allow for side to side adjustment.

DRI-DECK MATTING - ROLL OUT TRAY

The surface of one (1) tray shall be covered with black Dri-Deck mat.

LED COMPARTMENT LIGHTS

Two (2) extruded aluminum LED strip lights shall be installed in the compartment. The strip lights shall be installed in a vertical position and run the full height of the compartment, one (1) each side.

R1 COMPARTMENT

- *The following is a description of items included with the compartment.*

ROLL UP DOOR - BRUSHED

ROM series 4 roll-up door will be installed in this compartment. The shutters will be constructed from extruded aluminum with a brushed finish. Internally sealed for weather resistance and quiet operation. Rubber seals will be installed on the vertical components. The door will close/lock with a combination handle/locking bar on the exterior at the bottom.

The door will roll-up in the top of the compartment to allow for maximum use of the compartment interior.
Lighting will be located on the vertical compartment walls for maximum effectiveness.

ROLL UP DOOR SILLS

An extruded aluminum door sill shall be provided for each roll up door.

DOOR STRAP

An elastic door strap shall be installed on this compartment door to assist in lowering the door.

ADJUSTABLE SHELF TRACKING

There shall be tracking installed in one (1) compartment to accommodate the installation of adjustable shelves and/or roll-outs. The tracks shall be installed vertically on the walls of the compartment.

ADJUSTABLE TRACKING

There shall be tracking installed in the compartment to accommodate the installation of air pack brackets and/or equipment. The tracks shall be installed horizontally on the back wall of the compartment.

ADJUSTABLE SHELF- SHALLOW DEPTH

There shall be an adjustable shelf made from 3/16" aluminum with 2" sides provided and installed on the adjustable tracking.

ROLL OUT TRAY - FLOOR MOUNTED

A Slide-Master aluminum heavy duty 100% roll-out tray with a minimum capacity of 700# shall be provided and installed on the compartment floor. The tray shall be constructed of 3/16" aluminum with a 2" lip on each side. The roll-out mechanism shall include a push/pull spring lock for the full open and closed positions.

VERTICAL COMPARTMENT DIVIDERS ON ROLL-OUT TRAY

Three (3) bolt in vertical compartment dividers fabricated from 3/16" aluminum shall be provided and installed on the compartment roll-out tray.

The dividers will be mounted to adjustable tracking to allow for side to side adjustment.

DRI-DECK MATTING - ADJUSTABLE SHELF

The surface of one (1) shelf shall be covered with black Dri-Deck mat.

DRI-DECK MATTING - ROLL OUT TRAY

The surface of one (1) tray shall be covered with black Dri-Deck mat.

LED COMPARTMENT LIGHTS

Two (2) extruded aluminum LED strip lights shall be installed in the compartment. The strip lights shall be installed in a vertical position and run the full height of the compartment, one (1) each side.

R2 COMPARTMENT

- *The following is a description of items included with the compartment.*

ROLL UP DOOR - BRUSHED

ROM series 4 roll-up door will be installed in this compartment. The shutters will be constructed from extruded aluminum with a brushed finish. Internally sealed for weather resistance and quiet operation. Rubber seals will be installed on the vertical components. The door will close/lock with a combination handle/locking bar on the exterior at the bottom.

The door will roll-up in the top of the compartment to allow for maximum use of the compartment interior.
Lighting will be located on the vertical compartment walls for maximum effectiveness.

ROLL UP DOOR SILLS

An extruded aluminum door sill shall be provided for each roll up door.

DOOR STRAP

An elastic door strap shall be installed on this compartment door to assist in lowering the door.

ADJUSTABLE SHELF TRACKING

There shall be tracking installed in one (1) compartment to accommodate the installation of adjustable shelves and/or roll-outs. The tracks shall be installed vertically on the walls of the compartment.

ADJUSTABLE TRACKING

There shall be tracking installed in the compartment to accommodate the installation of air pack brackets and/or equipment. The tracks shall be installed horizontally on the back wall of the compartment.

ADJUSTABLE SHELF- SHALLOW DEPTH

There shall be an adjustable shelf made from 3/16" aluminum with 2" sides provided and installed on the adjustable tracking.

BACKWALL TOOLBOARD

A toolboard will be installed on the compartment upper back wall. The partition shall be made from 3/4" thick co-polymer material.

DRI-DECK MATTING - COMPARTMENT FLOOR

The surface of the compartment floor shall be covered with black Dri-Deck mat.

DRI-DECK MATTING - ADJUSTABLE SHELF

The surface of one (1) shelf shall be covered with black Dri-Deck mat.

LED COMPARTMENT LIGHTS

Two (2) extruded aluminum LED strip lights shall be installed in the compartment. The strip lights shall be installed in a vertical position and run the full height of the compartment, one (1) each side.

R3 COMPARTMENT

The following is a description of items included with the compartment.

ROLL UP DOOR - BRUSHED

ROM series 4 roll-up door will be installed in this compartment. The shutters will be constructed from extruded aluminum with a brushed finish. Internally sealed for weather resistance and quiet operation. Rubber seals will be installed on the vertical components. The door will close/lock with a combination handle/locking bar on the exterior at the bottom.

The door will roll-up in the top of the compartment to allow for maximum use of the compartment interior.
Lighting will be located on the vertical compartment walls for maximum effectiveness.

ROLL UP DOOR SILLS

An extruded aluminum door sill shall be provided for each roll up door.

DOOR STRAP

An elastic door strap shall be installed on this compartment door to assist in lowering the door.

ADJUSTABLE SHELF TRACKING

There shall be tracking installed in one (1) compartment to accommodate the installation of adjustable shelves and/or roll-outs. The tracks shall be installed vertically on the walls of the compartment.

ADJUSTABLE TRACKING

There shall be tracking installed in the compartment to accommodate the installation of air pack brackets and/or equipment. The tracks shall be installed horizontally on the back wall of the compartment.

ADJUSTABLE SHELF- SHALLOW DEPTH

There shall be an adjustable shelf made from 3/16" aluminum with 2" sides provided and installed on the adjustable tracking.

ROLL OUT TRAY - FLOOR MOUNTED

A Slide-Master aluminum heavy duty 100% roll-out tray with a minimum capacity of 700# shall be provided and installed on the compartment floor. The tray shall be constructed of 3/16" aluminum with a 2" lip on each side. The roll-out mechanism shall include a push/pull spring lock for the full open and closed positions.

DRI-DECK MATTING - ADJUSTABLE SHELF

The surface of one (1) shelf shall be covered with black Dri-Deck mat.

DRI-DECK MATTING - ROLL OUT TRAY

The surface of one (1) tray shall be covered with black Dri-Deck mat.

LED COMPARTMENT LIGHTS

Two (2) extruded aluminum LED strip lights shall be installed in the compartment. The strip lights shall be installed in a vertical position and run the full height of the compartment, one (1) each side.

SUPERSTRUCTURE AND BODY WARRANTY - LIFETIME

The manufacturer shall warrant to the original purchaser that the apparatus superstructure and body is structurally sound and free of all structural defects of workmanship and material and further warrants that it will maintain its structural integrity for the life of the apparatus. This warranty shall not pertain to issues of paint finish, hardware, moldings or accessories. The warranty shall terminate upon transfer of possession or ownership by the original purchaser.

ROLL-UP DOOR WARRANTY - SEVEN YEARS

ROM series 4 doors and parts shall be warranted for a period of seven (7) years.

COMPARTMENT INTERIOR FINISH

The apparatus compartment interiors will be finish painted with a gray spray-on bedliner material.

RUBRAILS

Poly rub rails shall be provided along the lower edge of the apparatus body. The rub rail assemblies shall be spaced-out and isolated from the body with non-metallic materials. Each rub rail shall be a minimum of 1" thick and tapered at each end.

BODY FACE PACKAGE

The front face of the apparatus body will be painted with a tinted bedliner to match the body color.

REAR TAILBOARD

An 11" rear tailboard step will be provided. The step will be constructed from 1-1/2" extruded aluminum. Extrusion shall have a non-slip surface with punched holes. Tailboard shall be supported by heavy 2" x 2" x 3/8" angles welded directly to the body superstructure.

CONE RACK

A cone rack shall be fabricated and mounted on the rear tailboard of the vehicle.

REAR WHEELWELL TRIM

The area around the rear wheel openings shall be constructed as part of the poly body and painted to match the apparatus body.

POLISHED FENDERETTES

Polished fenderettes shall be installed on the rear wheelwells. They shall be bolted so as to be easily removable for service and/or replacement.

MUDFLAPS

Mud flaps shall be made from black hard rubber and shall be installed on the cab fenders, behind the front tires and on the body fenders, behind the rear tires.

MISCELLANEOUS HARDWARE

One bag of miscellaneous hardware shall be supplied with the finished apparatus. This hardware shall consist of nuts, bolts, screws, washers, etc. used in the manufacture of the apparatus.

FUEL INLET

There shall be a fuel inlet located inside a SCBA wheelwell compartment. The bezel will be clearly marked "DIESEL FUEL ONLY".

The compartment door shall be a brushed stainless steel door secured by a positive latch.

SCBA BOTTLE STORAGE

There shall be four (4) double-tube SCBA bottle compartments located in the rear wheel well area. Each compartment shall have two (2) eight inch diameter poly tubes for air bottle storage. The driver side rear compartment shall have one (1) eight inch diameter poly tube to allow for the fuel fill. The tubes shall be supported at the front with a molded flange and at the rear with a metal strap. A gasketed stainless steel hinged door shall be installed on each compartment with a positive latch.

GROUND LADDER STORAGE

The apparatus shall be equipped with a ground ladder storage compartment configured through the polypropylene tank.

Access to the compartment shall be a roll-up style door, located at the rear of the apparatus.

SUCTION HOSE STORAGE

The apparatus shall be equipped with a suction hose storage compartment configured through the polypropylene tank. The compartment will accommodate two (2) lengths of 6" x 10' hard suction hose.

Access to the compartment shall be a roll-up style door, located at the rear of the apparatus.

PIKE POLE STORAGE

The pike poles shall be stored in tubes fabricated into the tank.

Access to the compartment shall be a roll-up style door, located at the rear of the apparatus.

LIGHTED FOLDING STEPS - FRONT - DRIVER SIDE

There shall be four (4) cast folding steps mounted as required on the front driver side of the apparatus body. The steps will be NFPA compliant. Each step shall include an LED light to light up the top of the step and another LED light to light up the area below the step. The lights will be activated with the parking brake.

LIGHTED FOLDING STEPS - FRONT - PASSENGER SIDE

There shall be four (4) cast folding steps mounted as required on the front passenger side of the apparatus body. The steps will be NFPA compliant. Each step shall include an LED light to light up the top of the step and another LED light to light up the area below the step. The lights will be activated with the parking brake.

REAR BODY ACCESS LADDER

A rear access ladder shall be made of 100% stainless steel and poly. The ladder will be installed on the back of the apparatus for access to the upper body walkway or hose bed. The ladder shall swing out and fold down for a natural climbing angle. The ladder folds up and stores against the body. The handrails are 1-1/2" poly with NFPA slip resistant testing.

INTERMEDIATE REAR STEP WITH GRAB HANDLES

An intermediate rear step will be provided at the rear of the apparatus for easy access to the top of the body. The step will be constructed from an open grip strut aluminum material or NFPA compliant diamondplate aluminum and bolted to extrusions in the structure of the apparatus body.

The intermediate rear step shall include laser cut hand holes to assist in climbing. The holes shall be large enough for a gloved hand and be located on each side of the step.

REAR BODY HANDRAILS

There shall be one (1) 30" long handrails manufactured from 1-1/4" diameter extruded aluminum with chrome end stanchions. It shall be mounted vertically at the rear of the apparatus body.

In the event there is telescoping scene light, ladder or folding step installed in the same location(s), these items may be substituted in an effort to conserve mounting space on the body.

REAR TOP BODY HANDRAIL

There shall be one (1) 1-1/4" diameter extruded aluminum handrail installed at the top of the apparatus body to assist in entering and exiting the hosebed. The hand rail shall be supported with chrome stanchions.

In the event there is telescoping scene light, ladder or folding step installed in the same location(s), these items may be substituted in an effort to conserve mounting space on the body.

FRONT OF BODY HANDRAILS

There shall be two (2) handrails manufactured from 1-1/4" diameter extruded aluminum with chrome end stanchions. They shall be mounted horizontally at the front of the apparatus body to assist in climbing the front steps.

In the event there is telescoping scene light, ladder or folding step installed in the same location(s), these items may be substituted in an effort to conserve mounting space on the body.

BODY PAINT FINISH

The body exterior shall have no mounted components prior to painting to assure full coverage.

All painted surfaces shall follow the following procedure to ensure a lasting finish:

Surfaces shall be sanded to remove all burrs and imperfections in material.

Upon the application of the required body fillers and their preparation, the unit shall be primed with a coating designed for corrosion resistance and surface paint adhesion. A sandable primer filler shall then be sprayed on the surface. This primer will be sanded smooth leaving the best surface for top coat. The apparatus body shall be painted with a high luster polyurethane paint system.

PAINT COLOR AND CODE: Match primary chassis color

PAINT WARRANTY - TEN YEARS

The paint performance guarantee will cover the areas of the vehicle finished with the specified product for a period of ten (10) years beginning the day the vehicle is delivered to the purchaser.

The areas as outlined on the Guarantee Certificate will be covered for the following paint failures:

GUARANTEE INCLUSIONS:

FULL APPARATUS BODY MANUFACTURED AND PAINTED BY THE MANUFACTURER:

- Peeling or de lamination of the topcoat and/or other layers of paint.
- Cracking or checking.
- Loss of gloss caused by cracking, checking, or hazing.
- Any paint failure caused by defective finishes which are covered by this guarantee.

All guarantee exclusions, limitations, and methods of claims are covered in the full certificate provided to the original purchaser.

The paint warranty is a full term (non-prorated) warranty.

TOUCH UP PAINT

A container with touch-up paint shall be provided with each truck. The container shall have a small touch-up brush that is attached to the top of the container.

DISSIMILAR METALS

The body and components shall be thoroughly protected against corrosion and/or oxidation caused by contact between dissimilar metals. These areas shall be protected by the use of corrosion resistant primers, gaskets and "ECK" (electrolic corrosion material) or any equivalent material.

NFPA BODY STRIPE

A 1" x 6" x 1" body stripe of gray / white / gray reflective is to be furnished around the entire apparatus with the exception of the wheel wells, pump panels, grille and rear of the apparatus over the chevron material.
Straight pattern chassis and body

CHEVRON STRIPING - REAR

Chevron striping shall be applied to the entire rear wall of the apparatus body. The chevrons shall consist of 6" wide Diamond Grade reflective striping at 45 degree angles from the tailboard in an inverted "V" pattern. The stripes shall alternate red reflective, lime reflective, red reflective, etc.

WELDON VMUX MULTIPLEXED ELECTRICAL SYSTEM

The apparatus body will be a continuation of the supplied Weldon VMUX electrical system that accommodates the needs of the apparatus as presented in the chassis section of our proposal.

All electrical equipment installed by the apparatus builder shall conform to current automotive electrical system standards and the latest standards as outlined in NFPA #1901.

All electrical wire installed by the apparatus builder shall be rated to carry 125 percent of the maximum current for which the circuit is protected. A high-temp automotive primary wire that is insulated with chemically cross-linked Polyethylene and withstands prolonged temperatures of up to 350 degrees F. without melting or fusing shall be used. Wire shall be highly resistant to grease, oil, acids, brake fluid and abrasion. Wire shall meet or exceed S.A.E. specifications J1127.

Electrical connections in exposed areas outside of the cab shall be made using heat shrink or weather-proof connections. All connections shall have a corrosion preventative compound applied to them. All weather exposed lights shall have the sockets coated with this same compound.

Wire shall be individually color coded and be labeled every six (6") inches on the insulation. Wiring installed by body builder shall be run in a heat protective loom that is held in place with a rubber coated bracket that is fastened in place with stainless steel screws.

There will be nodes that will be used as test points and for service. The location of these points will be in the apparatus cab and in an enclosed box recessed into the side or back wall of a rear compartment. All wire connections shall be protected to promote a lasting, corrosion-free connection. All exterior terminal blocks will be installed in a weather resistant box. All wire harnesses will be easily accessible and replaceable.

12-V NFPA TEST

The following NFPA 9-14 test requirements shall be performed:

- Reserve capacity test
- Alternator test at idle
- Alternator test at full load
- Low voltage alarm test

CLEARANCE LIGHTS AND REFLECTORS

Clearance lights and reflectors shall be installed to meet current DOT standards and include:

- Two (2) Red LED marker lights
- Four (4) Red reflectors
- Two (2) Amber reflectors
- One (1) Red LED three-light cluster under the rear step.

AUXILIARY TURN / RUNNING LIGHT

Two (2) auxiliary LED amber marker/turn lights shall be mounted just forward of rear axle, in the rear wheel well area. The lights shall be wired into the chassis light system and shall be mounted within a bezel.

STOP/TAIL, TURN AND BACKUP LIGHTS

Whelen M6 series lights shall be installed at the rear of the apparatus as follows:

- Red LED stop/tail light, one (1) each side
- Amber LED turn light, one (1) each side
- Clear LED backup light, one (1) each side

Each shall be installed inside a one-piece housing, one each side.

REAR LOWER LIGHTS BEZEL COLOR

The surface mounted lower stop/tail/turn and back up lights shall include chrome bezels.

LICENSE LIGHT AND BRACKET

A polished aluminum LED license plate light and bracket shall be installed on the rear of the vehicle.

LED PUMP GROUND LIGHTS (2)

Under body lighting will be provided for the apparatus pump module. Two (2) LED strip lights with clear lenses will be mounted below the runningboards, one (1) each side. The lights will be controlled by the parking brake switch.

LED BODY GROUND LIGHTS (4)

Under body lighting will be provided for the apparatus body. Four (4) LED strip lights with clear lenses will be mounted below the apparatus body, one (1) under each full height compartment. The lights will be controlled by the parking brake switch.

LED REAR TAILBOARD / BUMPER GROUND LIGHTS (2)

Under tailboard/bumper lighting will be provided for the rear of the apparatus. Two (2) LED strip lights with clear lenses will be angle mounted below the rear tailboard/bumper. The lights will be controlled by the parking brake switch.

RECESSED STEP LIGHTS - LED

There shall be LED recessed step lights mounted in such a manner as to light the area around the runningboards, tailboard, and rear intermediate step.

ACCESS LADDER STEP LIGHTS - LED

There shall be three (3) Whelen LED step lights mounted in such a manner as to light the area around the access ladder. The light shall be recess mounted in a rubber grommet or surface mounted in a chrome bezel.

PUMP SERVICE LIGHT

There shall be a LED light with clear lens mounted inside the pump compartment to provide sufficient lighting.

COMPARTMENT DOOR SWITCHES

All exterior compartment doors will be provided with a door switch that shall activate the "Door Ajar" indicator light.. The switch shall be installed not to interfere with loading or unloading the equipment stored within the compartment.

DOOR AJAR INDICATOR

There shall be a red flashing door-ajar indicator located on the cab in easy view of the driver. The light shall be illuminated automatically whenever the apparatus parking brake is released and the following conditions exist:

- Any passenger or equipment door is open.
- Any ladder or equipment rack is not in the stowed position.
- The aerial stabilizer system not in its stowed position.
- Powered light tower is extended.
- Any other device is opened, extended or deployed that creates a hazard, or is likely to cause damage to the apparatus if it is moved.

HOSEBED LIGHTS

A LED strip light shall be installed to light the hosebed. The light shall be activated by the park brake switch. The light shall be protected and be mounted at the front of the hosebed.

SIDE SCENE LIGHTS

The mid upper body sides shall include two (2) Fire Research Spectra SPA260-Q20 model scene lights, one (1) each side, which shall be surface mounted.

The light shall be mounted with four (4) screws to a flat surface. It shall be no more than 5 7/8" high by 14 1/2" wide and have a profile of less than 1 3/4" beyond the mounting surface. Wiring shall extend from a weatherproof strain relief at the rear of the lamphead.

The lamphead shall have sixty (60) ultra-bright white LEDs, 56 for flood lighting and 4 to provide a spot light beam pattern. It shall operate at 12/24 volts DC, draw 13.8/6.9 amps, and generate 20,000 lumens of light. The lamphead shall have a unique lens that directs flood lighting onto the work area and focuses the spot light beam into the distance.

REAR SCENE LIGHTS

The rear of the body shall include (2) Fire Research model LED900-Q70 surface mount lights, one (1) each side. Each light shall be 6.75 inches high X 9.00 inches wide and have a profile of less than 1.75 inches beyond the mounting surface. Wiring shall extend from a weatherproof strain relief at the rear of the light.

Each lamp head shall have twenty-four (24) white LEDs that generate a rated 7000 lumens at 12 or 24 volts DC. The lens shall redirect the light along the vehicle and out onto the working area.

SCENE LIGHTING BEZEL COLOR

The surface mounted scene lights shall include chrome bezels.

SCENE LIGHTING SWITCHING

The body and/or cab mounted scene lights shall include switches in the cab and on the pump panel. Each side of the apparatus will include its own switch if applicable.

SCENELIGHT BACKUP RELAY

A relay will be provided in the rear scene light circuit to allow automatic use of the lights when the vehicle is placed in reverse.

HOUSEHOLD DUPLEX RECEPTACLE- SHORE POWER

There shall be eight (8) 120-volt/20 amp household duplex receptacle(s) mounted as directed by the Fire Department. A hinged weatherproof cover shall be installed over any exterior mounted receptacle(s).

The receptacle(s) shall be flush mounted.

Location(s): L1, L2, L3, R1, R2, R3, Cab EMS, Side of Engine tunnel (quadbox)

RADIO INSTALLATION (2)

The apparatus shall have two (2) customer supplied single head radios and speakers installed as directed. Programming of the radio is not included.

PUMP PANEL RADIO BOX

There shall be an aluminum constructed box mounted on the pump panel. It shall be fully gasketed to protect the radio and speaker. The box shall be hinged and have a latch.

Design approval required

BACKUP CAMERA WIRING

Wiring and a weather shield shall be supplied for the chassis supplied backup camera. The camera shall be installed below the hosebody handrail, rear step or some other mechanism to prevent damage.

NFPA WARNING LIGHTS

The optical warning system on the fire apparatus shall be capable of two separate signaling modes during emergency operations. One mode shall signal that the apparatus is responding to an emergency and is calling for the right of way. The other mode shall signal that the apparatus is stopped and is blocking the right of way.

The switching for the two different modes shall be through switches and relays that sense the position of the parking brake.

REAR WHEEL WELL WARNING LIGHTS

The rear wheel wells shall include two (2) Whelen 6RB Rotobeam Super LED warning lights, one (1) on each side. The lights shall feature multiple flash patterns including steady burn. The lights shall be mounted to the sides of the body within a bezel.

The warning lights shall be red.

REAR TAILBOARD SIDE WARNING LIGHTS

The rear tailboard shall include two (2) Whelen 6RB Rotobeam Super LED warning lights, one (1) on each side. The lights shall feature multiple flash patterns including steady burn. The lights shall be mounted within a cast housing located on the top of the tailboard sides.

The warning lights shall be red.

FRONT UPPER BODY SIDE WARNING LIGHTS

The front upper body sides shall include two (2) Whelen M9 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 apparatus within a bezel.

The warning lights shall be red.

REAR UPPER BODY SIDE WARNING LIGHTS

The rear upper body sides shall include two (2) Whelen M9 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 apparatus within a bezel.

The warning lights shall be red.

UPPER REAR WARNING LIGHTS

The upper rear of the apparatus shall include two (2) Whelen M9 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 apparatus within a bezel.

The warning lights shall be red.

MID REAR WARNING LIGHTS

The middle rear of the apparatus 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 apparatus within a bezel.

The warning lights shall be green.

LOWER REAR WARNING LIGHTS

The lower rear of the apparatus shall include two (2) Whelen 6RB Rotobeam 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 apparatus within a bezel.

The warning lights shall be red.

WARNING LIGHTING BEZEL COLOR

The body and/or cab surface mounted warning lights shall include chrome bezels.

WARNING LIGHTING LENS COLOR

The body and/or cab surface mounted warning lights shall include colored lenses to match the warning light color.

WARNING LIGHTING SWITCHING

The body and/or cab mounted warning lights shall include switches in the cab. Each side of the apparatus will include its own switch if applicable.

A master warning light switch shall also be included.

TRAFFIC ADVISOR

A Whelen TAL65 LED traffic advisor shall be installed on the rear of the apparatus, as high as is practical. The light is a six (6) head LED bar and includes a Whelen control head.

The light shall be mounted within and protected by an intermediate step.

APPARATUS WARRANTY - TWO YEARS

The completed apparatus shall be warranted to be free from defects in workmanship and materials under normal use and service for a period of two (2) years from the date of delivery to the Fire Department. This warranty shall cover the costs for parts and labor for this period of time.

ROOF LADDER

One (1) Duo Safety Model 775-A, 12 foot aluminum roof ladder shall be provided on the apparatus. The ladder shall be equipped with folding steel roof hooks on one end and steel spikes on the other end. The ladder shall meet or exceed all latest NFPA Standards.

EXTENSION LADDER

One (1) Duo-Safety Model 1000-A, 20 foot two-section aluminum extension ladder shall be provided on the apparatus. The ladder shall meet or exceed all the latest NFPA standards.

FOLDING LADDER

One (1) Duo Safety Model 585-A, 10 foot folding aluminum ladder shall be provided on the apparatus. The ladder shall meet or exceed all the latest NFPA Standards.

PIKE POLE

One (1) Leatherhead 6' pike pole with lime handle shall be provided on the apparatus.

PIKE POLE

One (1) Leatherhead 8' pike pole with lime handle shall be provided on the apparatus.

SUCTION HOSE

Two (2) 6" x 10 foot lengths of AWG flexible suction hose shall be provided and equipped with 5" lightweight couplings.

STRAINER

One (1) Kochek Model LL50 strainer for drafting in low water conditions shall be provided. The strainer shall be constructed from aluminum with K-Coat finish and shall have an internal screen and incorporated jet siphon. The strainer shall be equipped with a 5" NH female long handle coupling.

WHEEL CHOCKS

One (1) pair of Worden model HWG Grip-Lock aluminum wheel chocks shall be mounted on the apparatus. They shall be mounted in model U815 slide-out brackets.

WHEEL CHOCKS LOCATION

The wheel chocks shall be mounted fore of the rear axle on bottom side of the lower compartments.

IRONS SET

One (1) Leatherhead Irons set including a 30" halligan, 6# flat axe, lime handles, reflector, black rubber grip shall be provided on the apparatus.

Location: Driver side mounted on cab rear interior wall

BOLT CUTTERS

One (1) set of bolt cutters and mounting bracket shall be provided on the apparatus.

Location: Driver side mounted on cab rear interior wall

PICK HEAD AXE

A Leatherhead 6lb steel pick head axe with a lime fiberglass handle shall be supplied.

Mounts and installation shall be included.

Location: Officer side mounted on cab rear interior wall

PIKE POLE

One (1) Leatherhead D-Ring 4' pike pole with lime handle shall be provided on the apparatus.

Location: Officer side mounted on cab rear interior wall

STREAMLIGHT FLASHLIGHT

There shall be four (4) Streamlight FIRE VULCAN 180, LED rechargeable flashlight(s) supplied and installed.

Location(s): Two (2) each side interior rear wall of cab

KOCHEK KS34 WRENCH SET

Two (2) Kochek KS34 wrench sets shall be supplied which each shall include four (4) KS3 wrenches and one (1) CAA19 holder.

Locations: One (1) each side of pump module

SPANNER WRENCHES WITH HOLDER

Two (2) Akron Brass Style 2443 , item 24430001 spanner wrenches with holder shall be provided. It shall be constructed of impact resistant nylon. The unit shall include two (2) Style 10 wrenches and one (1) Style 15 hydrant wrench.

Locations: One (1) each side of pump module

PORTABLE ATTACK MONITOR PACKAGE

Task Force Tips Blitzfire model XXC-32-BJ1 portable lightweight attack monitor package shall be supplied and shall include monitor, nozzle and storage bracket.

The monitor model number XX132A shall include an integral safety shut off valve that will automatically shut down the water flow in the event control of the monitor is lost. The water flow is controlled by a six-position detent, turbulence free slide valve. The detent flow control shall also function as the reset for the safety shut off valve to resume water flow.

The water inlet shall pivot up and down to allow for stability on uneven surfaces. The 2-1/2” (64 mm) discharge has vertical elevation travel between 10 and 40 degrees above horizontal with a ball and socket joint. The same ball and socket joint shall allow for horizontal adjustment of 20 degrees left and right of center. The monitor shall have a flow rating from 100 to 500 GPM (400-2000 l/min). Outlet has removable stream shaper.

The monitor shall have folding stabilization legs with carbide tips, which are concealed in the carry and stow positions. An integral carrying handle that also functions as an attachment point for the included anchor strap shall be provided. For corrosion resistance, the monitor shall be constructed from hardcoat anodized aluminum alloy and have a blue powder coat interior and exterior finish. The monitor shall have a 2-1/2” (64 mm) female BSP rocker lug swivel inlet and a 2-1/2” (64 mm) male BSP outlet.

Max-Force nozzle tip model number MD22A shall have a knob located at the front of the nozzle to allow for pressure rating adjustments of 100 or 55 PSI (7 or 4 bar) and a flow range of 100-500 GPM (400-2000 l/min). The nozzle shall have a 2-1/2” (64 mm) female BSP swivel rocker lug inlet.

The nozzle design shall allow for straight stream through dense wide fog patterns and be able to be flushed without shutting down. The ribbed rubber bumper shall allow for stream shape adjustment. For corrosion resistance and durability, the nozzle shall be constructed from hardcoat anodized aluminum alloy, a protective rubber bumper with fog teeth, and reflective labeling.

Task Force Tips model # XX-B storage bracket and mounting screws shall be supplied. The bracket shall be constructed from stainless steel and hardcoat aluminum and be designed for horizontal or vertical installation. The bracket shall include an adjustable strap assembly for elimination of nozzle movement. The bracket is designed for storage of the Blitzfire portable monitor. The monitor and nozzle shall each have a unique serial number and all components shall be covered by a five-year warranty.

Location: Rear body

MINI REFRIGERATOR

A Norcold NR740 AC/DC mini refrigerator shall be supplied and installed on the apparatus.

Location: Interior cab floor between supports for rear wall compartment

LOOSE EQUIPMENT MOUNTING

The following customer supplied loose equipment shall be installed in the cab EMS compartment.

TIC
AED
Gloves
Safety Vests

DELIVERY PREP

The apparatus shall be detailed and cleaned prior to delivery.

All metal edges shall be carefully sanded and rounded. All compartment and exterior sheeting seams shall be carefully caulked.

Any loose equipment shall be stored on the truck.

PLEASE PRICE THE FOLLOWING OPTION SEPARATE FROM THE BID

SINGLE STAGE FIRE PUMP (With Integral AutoCAFS)

The pump shall be a Darley LDMBC single stage fire pump.

Power to drive the pump shall be provided by the same engine used to propel the apparatus. The pump shall be midship mounted and designed to operate through an integral transmission, including a means for power selectivity to the driving axle or to the fire pump.

The pump casing shall be a fine grain cast iron alloy, vertically split, with a minimum 30,000 PSI tensile strength and bronze fitted.

The pump shall contain a cored heating jacket feature that, if selected, can be connected into the vehicle antifreeze system to protect the pump from freezing in cold climates.

The impeller shall be a high strength bronze alloy of mixed flow design, accurately balanced and splined to the pump shaft for precision fit and durability. The impeller shall feature a double suction inlet design with opposed volute cutwaters to minimize radial thrust.

The seal rings shall be renewable, double labyrinth, wrap around bronze type.

The pump shaft shall be precision ground stainless steel with long wearing titanium hard coating under the packing glands. The shaft shall be splined to receive broached impeller hubs, for greater resistance to wear, torsional vibration, and torque imposed by engine.

A stuffing box shall be provided and shall be of the plunger injection style, utilizing a plastallic composite packing equalizing pressure around the shaft. Packing shall be renewed by removing the plunger, inserting the packing, and reinstalling the plunger. This packing design shall be provided to minimize friction, heat generation, and apparatus down time. This feature is designed to allow replacement and/or adjustment of packing within a 15-minute time period.

Due to the advantages of the above packing feature, rope or braid type packing gland designs are not acceptable.

The bearings provided shall be heavy duty, deep groove, radial type ball bearings. They shall be oversized for extended life. The bearings shall be protected at all openings from road dirt and water splash with oil seals and water slingers.

The transmission case shall be heavy-duty cast iron alloy with adequate oil reserve capacity for low operating temperatures. The transmission case shall contain a magnetic drain plug for draining the gear case oil and a dipstick for checking and filling the level of the gear case through its opening. The transmission shall also allow the use of an external heat exchanger for increased cooling under extreme conditions.

The pump driveshaft shall be precision ground, heat-treated alloy steel, with a minimum 1-1/2" x 10" splined ends. Gears shall be helical design, and shall be precision cut for quiet operation and extended life. The gears shall be cut from high strength alloy steel, heat-treated and gas nitrided. The gear face shall be 3-1/2" minimum.

The gearshift shall be a heat-treated alloy steel splined spur gear to engage either the pump drive gear or the truck drive shaft gear. The gear ratio of the pump shall be selected by the pump and apparatus manufacturer's Engineering Department.

Due to the advantages of the above gear and drive feature, chain drive and designs requiring additional lubrication are not acceptable.

A discharge manifold, as supplied as part of the pump by the pump manufacturer, shall include a discharge check valve assembly to allow priming of the pump from draft with discharges open and caps off.

Due to the importance of the above discharge manifold and check valve assembly, intended to be included with the overall pump design, there shall be no exception allowed to this requirement.

Discharge outlets shall have extensions with companion flange openings to allow ease of service. Two ports shall be provided on a pump panel for testing of vacuum and pressure readings. A weather resistant Performance Data Plate shall be installed on a pump panel.

The pump priming system, heat exchanger system, discharge and suction valves, relief valves, pump shift, and master drain shall be as detailed elsewhere in these specifications.

Two (2) manuals covering the fire pump, pump transmission and selected options of the fire pump shall be provided with the apparatus.

CAFS COMPATIBLE

The pump transmission shall be designed to accommodate an integrated, air compressor mounting bracket. This bracket shall be installed to properly align a rotary screw air compressor with an external sprocket driven by the pump transmission. The air compressor shall be driven using a Gates "Poly Chain GT" belt drive system. The air compressor drive sprocket shall be supplied with an electric, multi plate, industrial clutch designed to be engaged at idle and allow disengagement at any rpm. The clutch shall incorporate an automatic, high CAFS oil temperature shut down to avoid damage to the rotary screw air compressor. An interlock shall be installed to disallow air compressor engagement if engine rpm is higher than recommended.

AIR COMPRESSOR SHIFT

Is accomplished using the Darley AutoCAFS Commander control.

220 CFM COMPRESSED AIR FOAM SYSTEM

The apparatus shall be equipped with the latest, high energy, automatic, compressed air foam system (AutoCAFS II).

Ratings: The fire pump and air compressor shall be sized to provide at least 220 CFM (cubic feet per minute) of compressed air while simultaneously flowing at least 440 GPM (gallons per minute) of water flow. The pressure of the system shall be set at 125 PSI for the duration of this test as outlined in the NFPA document 1906. This rating is consistent with the NFPA recommendation that the water pump shall discharge two gallons of water for every one CFM of compressed air discharge. Fire pumps with UL ratings in excess of 1000 GPM commonly flow near capacity while simultaneously operating the air compressor at full output.

Components: The air compressor shall be a high quality, industrial rated, modulating, continuous duty, and of rotary screw design. The air compressor shall be mechanically driven by the main pump and shall be so designed as to provide optimum performance at 70% of rated engine RPM. Air compressor drive train shall provide a means to engage and disengage the air compressor as required.

The air compressor system shall include a pressurized oil lubrication system, oil reservoir with receiver/separator elements, oil filter, inlet air filter, and modulating air inlet control. The air compressor shall be provided with a pressure control system to automatically balance air pressure to water pressure. The air compressor air inlet valve shall open and close to provide the air flow desired while maintaining the air system pressure to water pump pressure to within 5 PSI differential. This balancing system is essential for safe operation of a compressed air foam system.

The air compressor lubrication system shall require cooling water to be supplied from the fire pump through a heat exchanger to cool the air compressor oil. The essential water flow to this oil cooler shall be supplied using a self-cleaning, flushed strainer system to ensure a consistent flow of cooling water. The oil temperature shall be thermostatically controlled to remain at a consistent operating temperature within the range from 170° F to 190° F.

AIR COMPRESSOR SHIFT - AutoCAFS Commander

Panel Mounted Controls: The air compressor system shall have mounted on the operators control panel an "AutoCAFS Commander" electronic control used to engage and disengage the AutoCAFS air compressor. It includes an On/Off button with engagement light as well as the following features.

In addition to the On/Off control function, the AutoCAFS Commander also displays the following AutoCAFS information: AutoCAFS air compressor pressure in PSI (or KPA), AutoCAFS air compressor oil temperature in degrees F(or C), Chassis Engine RPM, Total CAFS operating hours.

The Commander provides a wide variety of safety interlocks to prevent accidental damage to the AutoCAFS air compressor and drive system. The AutoCAFS air compressor shall be engaged at idle or up to 1000 RPM. Speed protection shall be provided to disallow engagement at too high of engine rpm. An automatic overheat warning and shutdown shall be provided. An automatic over speed warning and shutdown shall be provided. Blow down protection shall be provided to avoid accidental re-engagement if air pressure in the system has not been given the proper amount of blow down time. Due to the added safety provided by the Commander and the importance of a high quality engagement system, no other air compressor engagement system shall be considered.

Additional Features:

Digital Air Pressure Gauge
Mode button to switch between RPM readout,
Hour meter, and optional air flow meter.
Digital Air Compressor Oil Temperature Reading
Programmable Engagement Speed Protection
Automatic Blow Down Pressure Protection
Programmable Over Speed Warning with light and
flashing message in Info Center
Programmable High Speed Auto Disengagement System
Programmable Over Heat Warning
Programmable High Temp Auto Disengagement System
Optional "AutoOn" setting. Allows automatic engagement
of the AutoCAFS air compressor any time the pump is placed
into gear and operated. This feature can be used to eliminate
two (2) steps when operating a CAFS when used in conjunction
with the FoamPro "AutoOn" feature in the foam proportioner.

CAFS AIR INJECTION - AUTOMATIC

The AutoCAFS II shall utilize automatic air flow switch controls to inject the proper volume of compressed air into the foam discharges. A panel mounted toggle switch control shall activate an electric valve used to automatically regulate the precise amount of compressed air independently into each compressed air foam system discharge. The air flow amount shall be factory preset to the proper levels. Each foam discharge shall include a manually adjustable valve mounted inside the pump compartment for fine tuning when desired.

The automatic control shall consist of a weatherproof toggle switch which electrically activates an air flow valve sized according to the SCFM requirement of the discharge. The 12-volt electric, one quarter turn, 1/2" stainless steel, ball valve shall open slowly in no less than 2 seconds to provide a smooth addition of air to the CAFS discharge. Each automatic air flow injection switch, mounted on the panel, shall be installed using a red protective switch cover. Each CAFS air injection switch shall be appropriately labeled.

Each of the components of this Automatic Compressed Air Foam System - (air compressor, drive system, foam proportioner, control and instrumentation system) shall be sized, driven, and installed to produce a well operating and reliable CAFS unit.

This (AutoCAFS II) compressed air foam system shall be completely assembled and tested by the fire pump manufacturing facility before delivery. The system shall then be installed by the fire apparatus manufacturer and retested for complete NFPA compliancy.

FOAM OUTLETS

The compressed air foam system shall be plumbed to provide both foam solution and compressed air to the following discharges using a stainless steel all welded manifold. The manifold shall incorporate an integral check valve, drain port, flow meter and injection fitting as needed for the installation of a fully automatic foam proportioner.

Detailed descriptions of these discharges shall be determined.

CAFS TESTING/MANUALS

The compressed air foam system shall be tested and run for a minimum of eight (8) hours prior to delivery. After testing is completed, the foam system and CAFS oil system strainers shall be removed and flushed. The system shall then be delivery tested once again to ensure all strainers, fittings, and components are installed properly.

Two (2) manuals for the CAFS pumping system shall be provided upon delivery.

FOAM PROPORTIONER – 2001 (Flowmeter provided by Darley in SS manifold)

A FoamPro 2001 Class A automatic, electronic, direct injection, foam proportioning system shall be installed on the discharge side of the pump. It shall provide foam to predetermined foam discharge(s). This foam system is completely automatic and requires only one push button to turn it on before the system is functioning.

The system shall incorporate a paddle wheel flow meter to measure the water flow, and based on the foam percentage selected at the controller the direct injection pump shall inject the proper amount of foam into the foam discharge(s).

The system is capable of providing precise foam solution concentration rates from 0.1% to 3% and is easily operator adjustable with the push button digital display control.

System Capacity - Foam Pump is capable of 2.5 gpm of foam output @ 150 psi. Pump motor is 1/2 HP 12 volt.

Foam Concentration	Water Flow Range
0.1%	20-2600 gpm
0.2%	20-1300 gpm
0.3%	20-833 gpm
0.5%	20-520 gpm
1.0%	20-260 gpm
3.0%	20-85 gpm

A check valve shall be installed between the flow meter and the injection fitting to avoid foam contamination back into the rest of the pump.

System Features:(4)Selectable modes for operator information
1) Flow mode: Displays the total amount of water being flowed out of the foam discharges(s). Foam system need not be enabled to function in this mode.

2) Total Water mode: When selected shows the total amount of water flowed out of the foam discharge(s) since the unit was in operation.

3) Foam Percentage% mode: When selected shows the percentage rate that foam is being injected at if the system was turned on. This percentage can be changed by pressing the up or down arrow buttons at the bottom of the display.

4) Total Foam mode: When selected shows the total amount of foam that has been injected since the unit was turned on.

System shall be provided with a low foam tank level switch which shall alert operator of low foam concentrate level and shall automatically shut unit off after two minutes.

Foam system flushing is achieved by simply turning off the unit and flowing water out of the discharge(s) that were previously flowing foam solution.

System shall be completely installed inside pump compartment, with digital control unit and instruction plate mounted on the pump operators control panel. An installation and operation manual shall be included with the system, and a one year warranty shall also be provided. The system shall be installed by a certified FoamPro dealer only, and shall be fully calibrated and tested for proper operation prior to delivery.

The option shall replace the Hale pump and its alike components.

The Foampro 2001 foam system shall remain.

All other pump intakes, discharges and specified pump module related items shall remain the same.

Note: The overall length of the apparatus will increase with the Darley Pump CAFS option. A drawing showing the design of the apparatus and overall length is requested with this option.