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|  | Grand Council of the Crees (Eeyou/Eenou Istchee)  Grand Conseil des Cris (Eeyou/Eenou Istchee)  ᐄᓅ/ᐄᔨᔫ ᒋᔐᐅᒋᒫᐤ  CREE NATION GOVERNMENT  GOVERNEMENT DE LA NATION CRIE  ***Capital Works and Services Department***  **270 Prince Street, Suite 202**  **Montréal (Québec) H3C 2N3**  Tel: (514) 861-5837 Fax: (514) 395-9099 www.gcc.ca |  |

**75 FOOT ARIAL QUINT**

**TECHNICAL SPECIFICATIONS**

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| Technical specifications | Conform  Yes No | | Comments |
| 1. **OBJECT:**   The purpose of this document is to clarify the main requirements to be met by the **75 FOOT ARIAL QUINT, 2020 OR NEWER.** |  |  |  |
| The purpose of this specification is to define the requirements and requirements for the supply of a fire-fighting truck for the fire protection service equipped with an aluminum extrusion-type body. These specifications aim to provide a unit to achieve the best results and get a truck of the best performance. These specifications reflect the minimum requirements for the type of construction and tests to which the unit must be submitted.  Note: The truck must be new and in working order |  |  |  |
| **The apparatus cab and chassis shall be custom. No commercial chassis will be accepted.**  **BRAND: E-ONE / PIERCE / ROSENBAUER MODEL: TYPHOON / ENFORCER / WARRIOR YEAR: 2019 OR MOST RECENT.** |  |  |  |
| The tenderer must supply with his tender the specifications, illustrations and other explanatory documents relating to his tender. |  |  |  |
| Technical specifications | Conform  Yes No | | Comments |
| 1. **ACCREDITATION :**   The manufacturer must provide a copy to the bid, attesting that it is certified to **ISO 9001: 2008 and FAMA standards.** |  |  |  |

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| Technical specifications | Conform  Yes No | | Comments |
| 1. **CERTIFICATION :**   The entire fire trucks must be constructed and certified in accordance with **CAN / ULC S515** applicable in Canada and approved by an ULC inspector at the **ACCREDITED VEHICLE MANUFACTURING PLANT**  **(NO EXCEPTIONS).** |  |  |  |
| Written proof provided by **ULC** must be included in the submission listing the fire manufacturer's registration for the manufacture of new water pumps with the appropriate accreditation body of the applicable **CAN / ULC S515 standard.** |  |  |  |
| A plaque certifying compliance with the applicable CA**N / ULC S515** standard shall be affixed to the pump control panel at the fire manufacturer. This plate must mention the name, contact details, manufacturer of the fire. **(NO EXCEPTION).** |  |  |  |
| The vehicle will also have to meet, in addition, the requirements of the **National Fire Protection Association 1901, 2016 (NO EXCEPTION**). |  |  |  |
| Any contentious issues **between ULC and NFPA 1901, the current CAN / ULC S515 will prevail over NFPA 1901, 2016. (NO EXCEPTION).** |  |  |  |
| The vehicle must comply with the laws and regulations in effect in the province of Québec, and in particular with the requirements of the Highway Safety Code of the Province of Québec and with the new regulations of the CSST on the pump / road system. |  |  |  |
| Technical specifications | Conform  Yes No | | Comments |
| 1. **CIVIL LIABILITY INSURANCE BY THE MANUFACTURER:**   The insurance coverage, by the fire manufacturer, shall not be less **than $ 25 million per event. ($ 25,000,000.00).** |  |  |  |
| A valid certificate of insurance, based on the amount listed above, must be provided with the tender documents, without exception. |  |  |  |
| A statement that the insurer undertakes to notify the City of the change in the event of termination or modification of the insurance policy must also appear on the certificate of insurance provided. |  |  |  |
| The purchase of a product from a supplier that carries a low limit of liability insurance coverage places an entity in a position not to be able to recover sufficient sums made available to them by the supplier. This situation suggests that a requested coverage of **$ 25,000,000** is, in the current context of the call for tenders, well-considered and important to consider as receivable and unqualified. |  |  |  |
| Technical specifications | Conform  Yes No | | Comments |
| 1. **EQUIVALANCE:**   Any equivalent or similar product proposed by a bidder will be considered "not equivalent" until the Cree Nation government shows in writing its agreement to such equivalence. |  |  |  |
| Any proposed equivalence must be accompanied by a complete description of the product or equipment to allow the Cree Nation government and consultant Mr. Ghyslain Robert to make their own assessment. |  |  |  |
| The Tenderer shall provide technical bulletin of each proposed equivalent products and document any mention "according to our standard" if it is registered on the part of the tenderer in the comments column. |  |  |  |
| **All items must be submitted by the tenderer for the acceptance by the Cree Nation Government.** |  |  |  |
| **NOT DOCUMENTING THE PROPOSED EQUIVALENCE (OR ANY MENTION "ACCORDING TO OUR STANDARD") WILL SYSTEMATICALLY RESULT IN REJECTION OF THE BID.** |  |  |  |
| **ANY REQUEST FOR SUBSTITUTION ON THE PART OF THE BIDDER MUST INCLUDE THE FOLLOWING INFORMATION:**   * **THE REASONS FOR THE REQUEST FOR SUBSTITUTION** * **THE PRICE OF THE SUBSTITUTE MATERIALS AND THE NAME OF THE MANUFACTURER** * **THE PRICE OF MATERIALS SUCH AS SPECIFIED IN THE ORIGINAL QUOTE** * **THE AMOUNT OF CREDIT OFFERED TO THE CREE NATION GOVERNEMENT** * **THE IMPACT ON THE EQUIPMENT** |  |  |  |
| Technical specifications | Conform  Yes No | | Comments |
| 1. **MATERIALS:**   All the materials, components or accessories entering production in different parts of the equipment will be brand new, top quality and must be in the current year of submission. **(NO EXCEPTIONS).** |  |  |  |
| Technical specifications | Conform  Yes No | | Comments |
| 1. **COMPLETE PRINTED MANUAL :**   The bidder shall provide with the vehicle upon delivery, one (1) complete delivery manual. This manual shall be in a notebook type binder, with reference tabs for each section of the vehicle. A companion compact disk (CD) with all of the printed material in an electronic format (Adobe Acrobat PDF) shall be provided.  Within each section shall be: |  |  |  |
| * Individual component manufacturer instruction and parts manuals |  |  |  |
| * Warranty forms for the body |  |  |  |
| * Warranty forms for all major components |  |  |  |
| * Warranty instructions and format to be used in compliance with warranty obligations |  |  |  |
| * Wiring diagrams |  |  |  |
| * Installation instruction and drawings for major parts |  |  |  |
| * Visual graphics and electronic photos for the installation of major parts |  |  |  |
| * Necessary normal routine service forms, publications and components of the body portion of the apparatus |  |  |  |
| * Technical publications for training and instruction on major body components |  |  |  |
| * Warning and safety related notices for personnel protection |  |  |  |
| * Cab and chassis manuals on parts, service and maintenance shall be provided |  |  |  |
| Technical specifications | Conform  Yes No | | Comments |
| 1. **OPERATION AND FAMILIARIZATION MANUAL:**   The bidder shall supply, at delivery, customized Operation & Familiarization Manual, complete with full-color photos of the actual, completed apparatus with each feature and control identified and its function explained.  Printed and on a USB key. |  |  |  |
| Safety, Operation, Maintenance and Troubleshooting sections will include information about each major component of the apparatus (chassis, pump, foam system, generator, electrical devices, etc.). The manual shall be specific to the apparatus (or group of apparatuses) being delivered. |  |  |  |
| All safety and warning labels shall be represented in the manual for subsequent safety inspections to ensure their continued presence on the apparatus. |  |  |  |
| The manufacturer shall submit a sample manual with the bid proposal. Failure to do so will result in rejection of the proposal. Reference to "on delivery" or "at pre-build" submission is not an acceptable response for the bid document. |  |  |  |
| “Similar” or “Representative” manuals will not be accepted. |  |  |  |
| Technical specifications | Conform  Yes No | | Comments |
| 1. **CHARACTERISTIC:**   The tenderer must enter the characteristics of the proposed equipment and indicate the unit's compliance for each paragraph in the appropriate column. |  |  |  |
| **Any omission of an indication of conformity for each paragraph will be considered "non-compliant" with this description (NO EXCEPTION).** |  |  |  |
| Technical specifications | Conform  Yes No | | Comments |
| 1. **PRELIMINARY DRAWING :**   A preliminary design of the proposed fire vehicle shall be provided at the time of submission of the bid. The design shall represent the proposed truck. A drawing of the font, of the right side, on the left side and of rear should be provided. |  |  |  |
| The final and approved design will be part of the contract documents. |  |  |  |
| Technical specifications | Conform  Yes No | | Comments |
| 1. **DESIGN DOCUMENTS :**   In order to ensure an adequate design of the proposed fire truck, the tenderer must attach to the call for tenders the following listed documents: |  |  |  |
| * Document for calculating the vertical and horizontal center of gravity of the proposed unit; |  |  |  |
| * Load distribution calculation document applied to the front and rear axle as required by **NFPA** |  |  |  |
| * Document to calculate the total amperage load of the vehicle in accordance with the **NFPA** standard. |  |  |  |
| In the event that the tenderer proposes a design with a vertical center of gravity height greater than 80%, the latter must perform a stability test as required by the **NFPA** standard before delivery of the truck. This test of inclination tested to the applicable standards should be photographed to ensure that this certification procedure can be verified by the Fire Department **(NO EXCEPTIONS)** |  |  |  |
| Technical specifications | Conform  Yes No | | Comments |
| 1. **PRE-PRODUCTION MEETING AND INSPECTIONS:**   A pre-production meeting must be held at the dealer or manufacturer prior to the production of the proposed truck. |  |  |  |
| A final inspection at the manufacturing plant should be carried out when the trucks are ready to be delivered. |  |  |  |
| The tenderer will be responsible for all transportation (airline tickets millage from postal code J0X3E0 @ .52 / km, accommodation, parking and food expenses for a representative of the Cree Nation Government, the fire chief and for Mr. Ghyslain Robert, Consultant for the pre-production meeting and for the final inspection. |  |  |  |
| An expense invoice will be sent after each visit. Terms shall be Net 30 days. |  |  |  |
| Mr. Ghyslain Robert, Consultant reserves the right to request photographs of the truck during construction. |  |  |  |
| Technical specifications | Conform  Yes No | | Comments |
| 1. **WARRANTIES:**   The guarantees will be effective as of the date of commissioning of the vehicle by the village. |  |  |  |
| The successful tenderer will be solely responsible for the application of the guarantee for all the equipment covered by this invitation to tender. |  |  |  |
| The tenderer must provide with his tender proof that the proposed truck can be repaired by guarantee from an authorized distributor of the manufacturer, with a minimum of 5 years’ experience in the proposed product, within a radius of 1500 Kilometers from the community |  |  |  |
| The successful tenderer must attach to the call for tender the names of the persons assigned to the emergency call service 24 hours a day, 7 days a week. |  |  |  |
| The tenderer undertakes to respond to a service call and to remedy the problem within a maximum of 48 hours following the call or email from the City's representative. |  |  |  |
| The cost of travel, accommodation and food of the technician for repairs on guarantees shall be borne by the successful tenderer. For a maximum of 3 service calls. |  |  |  |
| 1. **TRUCK PLATES:**   The bidder shall be responsible for plating at the SAAQ the fire truck. The truck shall be transphered in the community’s name |  |  |  |
| Technical specifications | Conform  Yes No | | Comments |
| 1. **SERVICE CONTRACT:**   The first annual pump and aerial test shall be included and shall be conducted in Eastmain. |  |  |  |
| Technical specifications | Conform  Yes No | | Comments |
| 1. **DELIVERY:**   The fire apparatus will be delivered by the bidder to each specific community specified in the bidding instructions. |  |  |  |
| The bidder must ensure that all technical equipment is in place before the vehicle is delivered. |  |  |  |
| The warranty on the apparatus must begin on the date of delivery of the vehicle. |  |  |  |
| The apparatus must be completely delivered no later than **425 days** after receipt of the order issued by the Cree nation government. |  |  |  |
| All equipment’s shall be delivered to the communities.   * Eastmain J0M 1W0, by way of Road |  |  |  |
| Technical specifications | Conform  Yes No | | Comments |
| 1. **TRAINING :**   The bidder shall provide 3 days of training  The training shall be conducted in the community |  |  |  |
| Technical specifications | Conform  Yes No | | Comments |
| 1. **CUSTOMER SERVICE:**   Operation Manual and Training:  The tenderer undertakes to supply at the time of delivery an operating manual for the equipment and components. |  |  |  |
| In order to guarantee the quality of the after-sales service, the Cree Nation Government requires each bidder to certify that it has an establishment enabling it to offer maintenance and after-sales service in Québec, and qualified and trained personnel trained by the manufacturer. |  |  |  |
| Such facilities shall include at least the following:   * repair shop; |  |  |  |
| Staff must include at least the following persons:   * a minimum of one (1) full-time, trained and certified technicians / mechanics. |  |  |  |
| * Certificates to be attached to the call for tender); |  |  |  |
| * an after-sales service manager. |  |  |  |
| * An mobile service unit |  |  |  |
| The first annual pump and Aerial test and maintenance shall be included. |  |  |  |
| Technical specifications | Conform  Yes No | | Comments |
| 1. **NEW TRUCK CHASSIS AND CAB:**   A "**CUSTOM"** type chassis and cab shall be provided, developed and designed specifically for the application of a fire vehicle. The custom truck must be new and the current year of the tender or the following year.  **(NO EXCEPTIONS)** |  |  |  |
| The cab will be of the tilting type. |  |  |  |
| The vehicle shall be distinguished by an all-welded aluminum and fully enclosed tilt cab. The cab shall be designed exclusively for fire/rescue service and shall be pre-engineered to ensure long life. It shall incorporate an integral welded substructure of high-strength aluminum alloy extrusions that creates an occupant compartment that is essentially a protective perimeter. The end result is a distinctive structure that is aesthetically appealing, functionally durable, and characterized by increased personnel safety. |  |  |  |
| The cab shall be constructed from 3/16” (0.188”) 3003 H14 aluminum alloy plate roof, floor, and outer skins welded to a high-strength 6063-T6 aluminum alloy extruded subframe. |  |  |  |
| Wall supports and roof bows are 6061 T6 aluminum alloy. This combination of a high-strength, welded aluminum inner structure surrounded on all sides by load-bearing, welded aluminum outer skins provides a cab that is strong, lightweight, corrosion-resistant, and durable. |  |  |  |
| The inner structure shall be designed to create an interlocking internal” roll-cage” effect by welding two (2) 3” x 3” x 0.188” wall-thickness 6063-T5 aluminum upright extrusions between the 3” x 3” x 0.375” wall-thickness 6061-T6 roof crossbeam and the 2.25” x 3” x 0.435” wall-thickness 6063-T6 subframe structure in the front. An additional two (2) aluminum upright extrusions within the back-of-cab structure shall be welded between the rear roof perimeter extrusion and the subframe structure in the rear to complete the interlocking framework. |  |  |  |
| The four (4) upright extrusions -- two (2) in the front and two (2) in the rear -- shall be designed to effectively transmit roof loads downward into the subframe structure to help protect the occupant compartment from crushing in a serious accident. All joints shall be electrically seam welded internally using aluminum alloy welding wire. |  |  |  |
| The subframe structure shall be constructed from high-strength 6061-T6 aluminum extrusions welded together to provide a structural base for the cab. It shall include a side-to-side 3” x 1.5” .375 thick C-channel extrusion across the front, with 3/4” x 2-3/4” (.75” x 2.75”) full-width crossmember tubes spaced at critical points between the front and rear of the cab. |  |  |  |
| The cab floor shall be constructed from 3/16” (0.188”) 3003 H14 smooth aluminum plate welded to the subframe structure to give the cab additional strength and to help protect the occupants from penetration by road debris and under-ride collision impacts. |  |  |  |
| The cab roof shall be constructed from 3/16” (0.188”) 3003 H14 aluminum treadplate supported by a grid of fore-aft and side-to-side aluminum extrusions to help protect the occupants from penetration by falling debris and downward-projecting objects. Molded fiberglass or other molded fiber-reinforced plastic roof materials are not acceptable. |  |  |  |
| The cab roof perimeter shall be constructed from 4” x 6-5/8” (4” x 6.625”) 6063-T5 aluminum extrusions with integral drip rails. Cast aluminum corner joints shall be welded to the aluminum roof perimeter extrusions to ensure structural integrity. The roof perimeter shall be continuously welded to the cab roof plate to ensure a leak-free roof structure.  The cab rear skin shall be constructed from 3/16” (0.188”) 3003 H14 aluminum plate. Structural extrusions shall be used to reinforce the rear wall. |  |  |  |
| The left-hand and right-hand cab side skins shall be constructed from 3/16” (0.188”) 3003 H14 smooth aluminum plate. The skins shall be welded to structural aluminum extrusions at the top, bottom, and sides for additional reinforcement. |  |  |  |
| The cab front skins shall be constructed from 3/16” (0.188”) 3003 H14 smooth aluminum plate. The upper portion shall form the windshield mask, and the lower portion shall form the cab front. Each front corner shall have a full 9” outer radius for strength and appearance. The left-hand and right-hand sides of the windshield mask shall be welded to the left-hand and right-hand front door frames, and the upper edge of the windshield mask shall be welded to the cab roof perimeter extrusion for reinforcement. The cab front shall be welded to the subframe C-channel extrusion below the line of the headlights to provide protection against frontal impact. |  |  |  |
| Technical specifications | Conform  Yes No | | Comments |
| 1. **FLAT ROOF:**   The cab roof shall be of the flat type.The roof of the cab shall be smooth aluminium and be painted. |  |  |  |

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| Technical specifications | Conform  Yes No | | Comments |
| 1. **CAB EXTERIOR:**   The exterior of the cab shall be 94” wide x 130” long to allow sufficient room in the occupant compartment for up to eight (8) fire fighters. The cab roof shall be approximately 101” above the ground with the flat roof option. The back-of-cab to front axle length shall be a minimum of 58”. |  |  |  |
| Front axle fenderette trim shall be rubber for corrosion resistance. Bolt-in front wheel well liners shall be constructed of 3/16” (0.188”) composite material to provide a maintenance-free, damage-resistant surface that helps protect the underside of the cab structure and components from stones and road debris. |  |  |  |
| The cab windshield shall be preferably one-piece replaceable design for lowered cost of repair. The windshield shall be made from 1/4” (0.25”) thick curved, laminated safety glass with a 75% light transmittance automotive tint. A combined minimum viewing area of 2,700-sq. in. shall be provided. Forward visibility to the ground for the average (50th percentile) male sitting in the driver`s seat shall be no more than 11 feet 7 inches from the front of the cab to ensure good visibility in congested areas. |  |  |  |
| Technical specifications | Conform  Yes No | | Comments |
| 1. **CAB INTERIOR:**   The interior of the cab shall be of the open design with an ergonomically-designed driver area that provides ready access to all controls as well as a clear view of critical instrumentation. |  |  |  |
| The engine cover between the driver and the officer shall be a low-rise contoured design to provide sufficient seating and elbow room for the driver and the officer. The engine cover shall blend in smoothly with the interior dash and flooring of the cab. An all-aluminum subframe shall be provided for the engine cover for strength. The overall height of the engine enclosure shall not exceed 23” from the floor at each side and 27” in the center section. The engine cover shall not exceed 41” in width at its widest point. |  |  |  |
| The rear portion of the engine cover shall be provided with a lift-up section to provide easy access for checking transmission fluid, power steering fluid, and engine oil without raising the cab. The engine cover insulation shall consist of 3/4” dual density fiberglass composite panels with foil backing manufactured to specifically fit the engine cover without modification to eliminate” sagging” as found with foam insulation. The insulation shall meet or exceed **DOT standard MVSS 302-1 and V-0 (UI subject 94 Test).** |  |  |  |
| All cab floors shall be covered with a black rubber floor mat that provides an aggressive slip-resistant surface in accordance with current **NFPA 1901.** |  |  |  |
| The rear engine cover area shall be covered with molded 18 lb/cu. ft. (+/-0.5) flexible integral skinned polyurethane foam at a Durometer of 60 (+/- 5.0) per ASTM F1957-99. The cover shall be approximately .5" thick with a minimum skin thickness of 0.0625 inches. |  |  |  |
| The cover shall be provided to reduce the transmission of noise and heat from the engine. |  |  |  |
| The cover shall be black with a pebble grain finish for slip resistance. |  |  |  |
| A minimum of 57.25” of floor-to-ceiling height shall be provided in the front seating area of the cab and a minimum of 55.25” floor-to-ceiling height shall be provided in the rear seating area. A minimum of 36” of seated headroom at the "H" point shall be provided over each fenderwell. |  |  |  |
| The interior side to side dimensions shall be 87" from wall padding to wall padding and 89.5" from door to door. |  |  |  |
| The floor area in front of the front seat pedestals shall be no less than 24" side to side by up to 25.0” front to rear for the driver and no less than 24" side to side by up to 27.0” front to rear for the officer to provide adequate legroom. |  |  |  |
| Battery jumper studs shall be provided to allow jump-starting of the apparatus without having to tilt the cab. |  |  |  |
| All exposed interior metal surfaces shall be pretreated using a corrosion prevention system.  The interior of the cab shall be insulated to ensure the sound (dbA) level for the cab interior is within the limits stated in the current edition of NFPA 1901. The insulation shall consist of 2 oz. wadding and 1/4” (0.25”) foam padding. The padding board shall be backed with 1/4” (0.25”) thick reflective insulation. The backing shall be spun-woven polyester.  Interior cab padding shall consist of a rear cab headliner, a rear wall panel, and side panels between the front and rear cab doors. |  |  |  |
| Technical specifications | Conform  Yes No | | Comments |
| 1. **CAB MOUNTS AND CAB TILT SYSTEM:**   The vehicle shall use a seven-position tilt and telescopic steering column to accommodate various size operators. An 18” padded steering wheel with a center horn button shall be provided. |  |  |  |
| Storage areas, with hinged access doors, shall be provided below the driver and officer seats. The driver side compartment shall be approximately 19.25” x 17.75” x 5.75” high and the officer side compartment shall be approximately 18.25” x 22.5” x 11” high (19.25” x 17.75” x 5.75” w/ air ride). |  |  |  |
| The front cab steps shall be a minimum of 8” deep x 24” wide. The first step shall be no more than 24.0” above the ground with standard tires in the unloaded condition per NFPA 1901 standards. The rear cab steps shall be a minimum 12” deep x 21” wide. The first step shall be no more than 24.0” above the ground with standard tires in the unloaded condition per **NFPA 1901** standards. The rear steps shall incorporate intermediate steps for easy access to the cab. The steps are to be located inside the doorsill, where they are protected against mud, snow, ice, and weather. The step surfaces shall be aluminum diamond plate with a multi-directional, aggressive gripping surface incorporated into the aluminum diamond plate in accordance with current NFPA 1901.  A black grip handle shall be provided on the interior of each front door below the door window to ensure proper hand holds while entering and exiting the cab. An additional black grip handle shall be provided on the left and right side windshield post for additional handholds. |  |  |  |
| Technical specifications | Conform  Yes No | | Comments |
| 1. **CAB DOORS:**   There shall be reflective signs on each cab door in compliance with all NFPA requirements.  Four (4) side-opening cab doors shall be provided.  The doors shall have a red flashing led light. Those lights shall be operational when the doors are opened. |  |  |  |
| Doors shall be constructed of a 3/16” (0.188”) aluminum plate outer material with an aluminum extruded inner framework to provide a structure that is as strong as the side skins.  Front cab door openings shall be approximately 36” wide x 71.5” high, and the rear cab door openings shall be approximately 33.75” wide x 73” high. The front doors shall open approximately 75 degrees, and the rear doors shall open approximately 80 degrees. |  |  |  |
| The doors shall be securely fastened to the doorframes with full-length, stainless steel piano hinges, with 3/8” (0.375”) diameter pins for proper door alignment, long life, and corrosion resistance. Mounting hardware shall be treated with corrosion-resistant material prior to installation. For effective sealing, an extruded rubber gasket shall be provided around the entire perimeter of all doors. |  |  |  |
| Stainless steel paddle-style door latches shall be provided on the interiors of the doors. The latches shall be designed and installed to protect against accidental or inadvertent opening as required by **NFPA 1901.** |  |  |  |
| The front door windows shall provide a minimum viewing area of 530 sq. in. each. The rear door windows shall provide a minimum viewing area of 500 sq. in. each. All windows shall have 75% light transmittance automotive safety tint. Full roll-down windows shall be provided for the front cab doors with worm gear drive cable operation for positive operation and long life. Scissors or gear-and-sector drives are not acceptable. |  |  |  |
| Technical specifications | Conform  Yes No | | Comments |
| 1. **CAB STEPS:**   The cab steps shall meet **NFPA 13-7.3 in size** and slip resistance requirements. |  |  |  |
| An auxiliary step below the cab door shall be provided. The step shall be constructed of .188”  aluminum tread. The step surface shall be provided with an aggressive skid-resistant surface and have an open back. The step shall be in accordance with current NFPA requirements and shall include a multi-directional aggressive gripping surface incorporated into the diamond plate. The surface shall extend vertically from the diamond plate sheet a minimum of 1/8" (0.125"). Gripping surfaces shall be circular in design, a minimum of 1" diameter and on centers not to exceed 4".  The step shall be located driver's front door, officer's front door, driver's rear door, officer's rear door. |  |  |  |
| Steps under front cab doors shall not interfere with approach angle. |  |  |  |
| LINE-X package for custom cab steps: Includes cab step wells (everything below the cab floor) and all welded and bolt on steps including stirrup and swing out steps as applicable. Steps hanging below the cab shall have LINE-X coating inside and outside.  DEF tank door or any other access doors are also included in this package if located in the step well area below the cab floor. |  |  |  |
| Technical specifications | Conform  Yes No | | Comments |
| 1. **CAB STEPS KICK PLATES:**   The cab step risers at all doors, the vertical section of all steps, shall include an aluminum tread plate.  The tread plate shall be covered in LINEX, black in color. |  |  |  |
| Technical specifications | Conform  Yes No | | Comments |
| 1. **AUXILIARY CAB STEPS:**   The cab shall be equipped with four (4) auxiliary stirrup style steps. There shall be one installed below each cab door opening. The frame shall be constructed of marine grade aluminum, and the stepping surface shall be constructed of heavy duty aluminum. The step surface shall be designed to function under the most adverse conditions.  The steps shall be covered in LINEX, black in color. |  |  |  |
| Technical specifications | Conform  Yes No | | Comments |
| 1. **FULL HEIGHT DOORS:**   All doors shall be full height from the roof of the cab extending down to cover and protect the entrance step areas. |  |  |  |
| Aluminum treadplate door kick panels shall be provided.  The tread plate shall be covered in LINEX, black in color. |  |  |  |
| Technical specifications | Conform  Yes No | | Comments |
| 1. **DOOR HANDLES:**   The exterior door handles shall be constructed of die-cast steel. They shall feature heavy duty pull down style handles which are extended out and suitable for easy grasping with a gloved hand. |  |  |  |
| The handles shall be complimentary to the cab exterior and shall be chrome. |  |  |  |
| The interior door handle shall be a paddle style which shall be black in color. The paddle shall be hinged towards the front of the cab and shall include a manual door lock unless otherwise specified. |  |  |  |
| Technical specifications | Conform  Yes No | | Comments |
| 1. **CAB DOOR LOCKS:**   All cab doors shall include manual door locks with keys. The door lock shall include a toggle and shall be an integral part of the interior door handle which is red in color. The exterior door lock is integral with the door latch. The cab doors may be unlocked from the exterior with a key or through a thumb turn from inside the cab. |  |  |  |
| Technical specifications | Conform  Yes No | | Comments |
| 1. **INTERIOR CAB DOORS:**   The inner door panels shall be made from smooth aluminium plate for increased durability. The cab door panels shall incorporate an easily removable panel for access to the latching mechanism for maintenance or service. |  |  |  |
| All cab doors interior shall be finished with a polyurethane coating for durability. The finish shall be black in color. |  |  |  |
| Reflexite chevron reflective striping shall be supplied on each of the cab doors.  The stripes shall run from the lower outer corner to the upper inside corner of the panel, forming an "A" shape when viewed from the rear. The material shall **meet NFPA 1901** requirements for size (96 square inches) and reflectivity. |  |  |  |
| Technical specifications | Conform  Yes No | | Comments |
| 1. **INTERIOR FRONT DOOR HANDLES:**   The interior driver and officer cab doors shall each include one (1) customized single piece door grab pulls designed specifically for the fire service. |  |  |  |
| The door pull shall feature secure mounting in three separate locations of the pull utilizing stainless steel fasteners with nut inserts in each location. Self-taping screws or other mounting techniques shall not be allowed for interior door pulls or grab handles. |  |  |  |
| Technical specifications | Conform  Yes No | | Comments |
| 1. **INTERIOR GRAB HANDLE REAR DOOR:**   A grab handle shall be provided on the inside of each rear crew door. The handle shall extend horizontally just above the windowsill. The handle shall assist with entry and egress from the crew area of the vehicle. |  |  |  |
| The interior driver and officer rear cab crew doors shall include one (1) customized door grab pulls designed specifically for the fire service.  The door pulls shall have an ergonomic curve making them easier to grasp when entering and exiting the cab. **NO EXCEPTIONS.** |  |  |  |
| The door pull shall feature secure mounting with stainless steel fasteners with nut inserts in each location. Self-taping screws or other mounting techniques shall not be allowed for interior door pulls or grab handles. |  |  |  |
| Technical specifications | Conform  Yes No | | Comments |
| 1. **GRAB HANDLES "A" PILLAR:**   There shall be two (2) additional molded 9.00” rubberized grab handle shall be installed inside the front cab doors. The handles shall be located one on the Driver’s side A Pillar and one on the officer's side on the A Pillar. |  |  |  |
| Technical specifications | Conform  Yes No | | Comments |
| 1. **WINDSHIELD WIPER SYSTEM:**   Two (2) pantograph-style windshield wipers with two (2) separate electric motors shall be provided for positive operation**. Air-operated windshield wipers are not acceptable because of their tendency to accumulate moisture**, which can lead to corrosion or to freezing in cold weather.  The wipers shall be a wet-arm type with a one (1) gallon washer fluid reservoir, an intermittent-wipe function, and an integral wash circuit. Wiper arm length shall be approximately 28”, and the blade length approximately 20”. Each arm shall have a 70 degree sweep for full coverage of the windshield. |  |  |  |
| Technical specifications | Conform  Yes No | | Comments |
| 1. **REAR DRIVER SIDE CREW WINDOW:**   The rear driver's side crew door shall include a window measuring 26.75" wide x 21.75" high with a minimum clear viewable area of 581 square inches.  The glass shall include a standard automotive tint and through the use of a manual crank style handle shall roll completely into the door housing. |  |  |  |
| Technical specifications | Conform  Yes No | | Comments |
| 1. **REAR OFFICER SIDE CREW WINDOW:**   The rear officer's side crew door shall include a window measuring 26.75" wide x 21.75" high with a minimum clear viewable area of 581 square inches. The glass shall include standard automotive tint and through the use of a crank style handle shall roll completely into the door housing. |  |  |  |
| Technical specifications | Conform  Yes No | | Comments |
| 1. **REAR CAB CANOPY SIDE WINDOWS:**   There shall be a fixed window provided between the front and rear doors on the driver`s and the officer side of the cab.  Window dimensions shall be as follows: |  |  |  |
| * 44" C/A cab (short cab): 16"W x 24.5"H |  |  |  |
| * 58" - 80" C/A cab (medium - extended): 26.69"W x 24.5"H |  |  |  |
| Technical specifications | Conform  Yes No | | Comments |
| 1. **CAB INSULATION:**   The cab shall be completely insulated from road and vehicle resonance, exterior sound and thermal intrusion. |  |  |  |
| The interior cab insulation system shall ensure that no seated position within the cab exceeds 72dB as certified by the manufacture. This decibel rating shall be measured with the apparatus traveling 45 mph with climate control settings off. |  |  |  |
| All insulation used in the construction of the cab shall be marine grade featuring longevity and resistance to degradation. |  |  |  |
| The interior of the cab including the rear wall and ceiling panels shall be insulated. |  |  |  |
| The cab insulation shall be heavy duty as this apparatus will operate in extreme cold conditions. |  |  |  |
| Technical specifications | Conform  Yes No | | Comments |
| 1. **ENGINE TUNNEL INSULATION:**   The engine tunnel shall include an insulated barrier from noise on the underside of each tunnel surface. This barrier shall be engineered for surrounding engines. |  |  |  |
| The insulation barrier shall provide an acceptable decibel level within the cab meeting or exceeding the recommendations of **NFPA 1901.** |  |  |  |
| The thickness of the engine tunnel insulation shall be 1" thick. The insulating material shall be open cell polyether based foam with a textured surface, specifically designed for acoustic absorption. |  |  |  |
| The engine tunnel insulation shall be precisely cut and sealed to fit each segment on the underside of the tunnel surface. The insulation shall then be affixed by a pressure sensitive adhesive. |  |  |  |
| Technical specifications | Conform  Yes No | | Comments |
| 1. **CAB UNDERBODY INSULATION:**   The underside of the cab shall include at a minimum of 1" seal Cab-Foam insulation offering reducing vibration noise and thermal effect to the interior of the cab. |  |  |  |
| Technical specifications | Conform  Yes No | | Comments |
| 1. **DAMPING INSULATION:**   The entire cab, including the ceiling and walls shall include additional insulation reducing structure borne noise from vibration, impact and resonance within the cab. |  |  |  |
| Technical specifications | Conform  Yes No | | Comments |
| 1. **INTERIOR TRIM MATERIAL:**   The interior trim shall feature a 31 oz. marine grade vinyl which features a tensile strength of **ASTM D751** of excellent, tear strength meeting the Federal standard **191-5134** of excellent and shall be oil resistant passing the **CID-A-A-2950A** requirement for no permeation. |  |  |  |
| Due to the excellent qualities of the marine grade vinyl material, no other type of interior trim shall be acceptable. **NO EXCEPTIONS.** |  |  |  |
| The soft trim vinyl shall feature mildew resistance passing **ASTM G21-90** and shall be rated to -25 degrees Fahrenheit. |  |  |  |
| The vinyl shall be flame retardant meeting **California Fire Code 117, UFAC Class 1, and BIFMA Class 1** and shall have a high resistance to abrasion. |  |  |  |
| The interior of the cab side wall soft trim shall be black in color and the ceiling panel soft trim shall be gray in color. |  |  |  |
| Technical specifications | Conform  Yes No | | Comments |
| 1. **REAR WALL INTERIOR MATERIAL:**   The rear wall of the cab shall be covered in aluminum diamond plate for durability and appearance. |  |  |  |
| Technical specifications | Conform  Yes No | | Comments |
| 1. **FLOOR MAT:**   The interior flooring of the cab shall be covered with an advanced black multi-layer acoustic dampening mat. The floor matting shall be an open/closed cell, flexible polyurethane polyamide material with frictional dampening and dissipation properties. The mat shall be a fire and skid resistant non-wicking material. |  |  |  |
| Technical specifications | Conform  Yes No | | Comments |
| 1. **SUN VISORS:**   The driver and officer seats shall feature a sun visor mounted in the header over each seating position. The sun visors shall be tinted plastic. |  |  |  |
| Technical specifications | Conform  Yes No | | Comments |
| 1. **INTERIOR CAB FINISH:**   The interior cab shall be finished in a high performance polyurethane coating including the interior A, B, C and D pillars, all occupant seat frames and any surrounding surfaces extending to the ball seal around each door. This type of coating shall feature: |  |  |  |
| * Durability, scratch, chemical and abrasion resistance |  |  |  |
| * Consistent, even coverage and a uniform texture |  |  |  |
| * Resistance from fading from exposure to UV light |  |  |  |
| * Gray in color |  |  |  |
| Technical specifications | Conform  Yes No | | Comments |
| 1. **CAB DASH:**   This design allows for the following features: |  |  |  |
| The center and officer side dash shall be constructed from .125" smooth aluminum plate painted to match the cab interior. A hinged access panel shall be provided on top of the center dash to provide easy access to components within. |  |  |  |
| The lower kick panels below the dash to be constructed from .125" aluminum diamond plate. |  |  |  |
| The panels shall be removable to allow for servicing components that may be located behind the panels. |  |  |  |
| Technical specifications | Conform  Yes No | | Comments |
| 1. **CAB INSTRUMENTS AND CONTROLS:**   Two (2) pantograph-style windshield wipers with two (2) separate electric motors shall be provided for positive operation. Air-operated windshield wipers are not acceptable because of their tendency to accumulate moisture, which can lead to corrosion or to freezing in cold weather. |  |  |  |
| The wipers shall be a wet-arm type with a one (1) gallon washer fluid reservoir, anintermittent-wipe function, and an integral wash circuit.  Wiper arm length shall be approximately 28”, and the blade length approximately 20”. Each arm shall have a 70 degree sweep for full coverage of the windshield. |  |  |  |
| Cab controls shall be located on the cab instrument panel in the dashboard on the driver`s side where they are clearly visible and easily reachable. Emergency warning light switches shall be installed in removable panels for ease of service. |  |  |  |
| The following gauges and/or controls shall be provided:   * Master battery switch/ignition switch (rocker with integral indicator) |  |  |  |
| * Starter switch/engine stop switch (rocker) |  |  |  |
| * Heater and defroster controls with illumination |  |  |  |
| * Marker light/headlight control switch with dimmer switch |  |  |  |
| * Self-canceling turn signal control with indicators |  |  |  |
| * Windshield wiper switch with intermittent control and washer control |  |  |  |
| * Master warning light switch |  |  |  |
| * Transmission oil temperature gauge |  |  |  |
| * Air filter restriction indicator |  |  |  |
| * Pump shift control with green ”pump in gear” and ”o.k. to pump” indicator lights • Parking brake controls with red indicator light on dash |  |  |  |
| * Automatic transmission shift console |  |  |  |
| * Electric horn button at center of steering wheel |  |  |  |
| * Cab ajar warning light on the message center enunciator |  |  |  |
| Controls and switches shall be identified as to their function by backlit wording adjacent to each switch, or indirect panel lighting adjacent to the controls. |  |  |  |
| Technical specifications | Conform  Yes No | | Comments |
| 1. **CAB DASH & ENGINE TUNNEL:**   Engine Cover  The engine cover shall blend in smoothly with the interior dash and flooring of the cab. The upper left and right sides shall have a sloped transition surface running front to rear providing increased space for the driver and officer. |  |  |  |
| The engine cover and engine service access door cover shall be molded 18 lb/cu. ft. (+/-0.5) flexible integral skinned polyurethane foam at a Durometer of 60 (+/- 5.0) per ASTM F1957-99. The cover shall be approximately .5" thick with a minimum skin thickness of 0.0625 inches. The cover shall be provided to reduce the transmission of noise and heat from the engine. |  |  |  |
| The cover shall be gray and feature a pebble grain finish for slip resistance. |  |  |  |
| The cab dash and the engine tunnel of the cab shall be coated with polyurethane coating for a durable finish. The color shall be gray. |  |  |  |
| Technical specifications | Conform  Yes No | | Comments |
| There shall be a 1/8" thick tread plate kick plate mounted in the rear of the engine tunnel. It shall be the full width of the engine tunnel by approximately 13.00 inches high. |  |  |  |
| Technical specifications | Conform  Yes No | | Comments |
| 1. **CUP HOLDER:**   A cup holder and tray assembly shall be provided on the cab engine cover between the driver and officer. The tray shall be approximately 14" wide x 10" long x 1.5" tall and constructed from .125" aluminum plate. |  |  |  |
| The top edge of the tray sides shall have a .5" lip and the front corners of the tray shall be tapered for dash access. The two (2) cup holders shall be constructed from 3.5" diameter pipe approximately 2.5" tall and be located one each side at the rear corners of the tray. The assembly shall be painted to match the cab interior color. |  |  |  |
| A severe duty forward overhead console, air conditioning plenum and rear facing blower cover shall be provided. Each overhead console section shall be constructed of aluminum smooth plate painted to match the cab interior. The console shall be installed using stainless steel fasteners. |  |  |  |
| Technical specifications | Conform  Yes No | | Comments |
| 1. **COLD WEATHER CAB PACKAGE:**   Additional insulation shall be provided on the front cab wall. |  |  |  |
| The insulation shall consist of a reflective backing covered air core insulation.  Insulation shall be provided on the rear cab heater hose lines (if equipped). |  |  |  |
| A thermostatically controlled clutch type cooling fan shall be installed on the chassis engine. |  |  |  |
| Technical specifications | Conform  Yes No | | Comments |
| 1. **HEATING/AIR CONDITIONING:**   An overhead air-conditioner / heater system with a single radiator mounted condenser shall be supplied. |  |  |  |
| The unit shall be mounted to the cab interior headliner in a mid cab position, away from all seating positions. The unit shall provide ten (10) comfort discharge louvers, four (4) to the back area of the cab and six (6) to the front. These louvers will be used for AC and heat air delivery. Two (2) additional large front louvers shall be damper controlled to provide defogging and defrosting capabilities to the front windshield as necessary.  The unit shall consist of a high output evaporator coil and heater core with one (1) high output dual blower for front air delivery, and two (2) high performance single wheel blowers for rear air delivery. |  |  |  |
| The control panel shall actuate the air-distribution system with air cylinders, which are to be separated from the brake system by an 85-90 psi pressure protection valve. A three-speed blower switch shall control air speed.  The condenser shall be radiator mounted and have a minimum capacity of **65,000 BTU`**s and shall include a receiver drier.  Performance Data: (Unit only, no ducting or louvers) |  |  |  |
| * AC BTU: 55,000 |  |  |  |
| * Heat BTU: 65,000 |  |  |  |
| * CFM: 1300 @ 13.8V (All blowers) |  |  |  |
| The compressor shall be a ten-cylinder swash plate type Seltec model TM-31HD with a capacity of 19.1 cu. in. per revolution.  The system shall be capable of cooling the interior of the cab from 100 degrees ambient to 75 degrees or less with 50% relative humidity in 30 minutes or less. |  |  |  |
| Heating and air conditioning controls shall be located in the center dash area. |  |  |  |
| Technical specifications | Conform  Yes No | | Comments |
| 1. **ADDITIONAL HEATING SYSTEM:**   A single 40,000 BTU water heater shall be supplied in the front area of the cab. The unit shall heat the lower section of the driver`s and officer`s footwell. |  |  |  |
| Dual 23,000 BTU water heaters with diamond plate covers shall be supplied in the rear of the cab to heat the rear cab lower section. |  |  |  |
| Dual climate control will be achieved via dual switches installed on a front instrument panel. On units with optional multiplex display climate control, the floor heaters shall be controlled through the HVAC screen in the display. |  |  |  |
| Technical specifications | Conform  Yes No | | Comments |
| 1. **HEATER HOSE:**   The heater hose inside the cab for the HVAC system shall be premium silicone hose. |  |  |  |
| The heater hoses leading from the engine to the cab shall include a foam insulation wrap which runs the length of the hose improving heating in extreme cold climates. The heater hoses which shall be routed inside the cab shall not be insulated. |  |  |  |
| Technical specifications | Conform  Yes No | | Comments |
| 1. **DRIVER SEAT:**   One (1) H. O. Bostrom 400 Series Sierra Air- 100RX4 suspension seats with high back styling shall be supplied for the driver position.  Features shall include: |  |  |  |
| * Air-100 suspension assembly with weight, height and ride adjustment. |  |  |  |
| * Built in lumbar support. |  |  |  |
| * 4” vertical suspension motion. |  |  |  |
| * 5” fore and aft adjustment. |  |  |  |
| All seat positions shall have a bright red retractable 3-point lap and shoulder harness, providing additional safety and security for personnel. Extensions shall be provided with the seat belts so the male end can be easily grasped and the female end easily located while sitting in a normal position.  The seat back shall include the fire department logo. The logo shall be centered on the standard headrest of the seat back. |  |  |  |
| Technical specifications | Conform  Yes No | | Comments |
| 1. **OFFICER SEAT:**   One (1) H. O. Bostrom 400 Series fixed seat with high back SCBA storage for the officer`s position shall be supplied.  Features shall include: |  |  |  |
| * Removable ”Store-All” side cushions. |  |  |  |
| * Auto-pivot and return headrest to open for improved exit with SCBA. |  |  |  |
| * 12.5” wide SCBA cavity to store leading SCBA Brands. |  |  |  |
| * Built in lumbar support. |  |  |  |
| * Replaceable seat, side and headrest cushions. |  |  |  |
| All seat positions shall have a bright red retractable 3-point lap and shoulder harness, providing additional safety and security for personnel. Extensions shall be provided with the seat belts so the male end can be easily grasped and the female end easily located while sitting in a normal position. |  |  |  |
| 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 seats shall include a covering of high strength, wear vinyl. It shall be black in color. |  |  |  |
| The seat back shall include the fire department logo. The logo shall be centered on the standard headrest of the seat back. |  |  |  |
| Technical specifications | Conform  Yes No | | Comments |
| 1. **REAR FACING OUTER SEAT:**   One (1) Bostrom 400 Series tanker 450 SCBA high back SCBA storage seat shall be provided in the rear facing position over the driver side wheel well.  Features shall include: |  |  |  |
| * Removable ”Store-All” side cushions. |  |  |  |
| * Auto-pivot and return headrest to open for improved exit with SCBA. |  |  |  |
| * 12.5” wide SCBA cavity to store leading SCBA Brands. |  |  |  |
| * Built in lumbar support. |  |  |  |
| * Replaceable seat, side and headrest cushions. |  |  |  |
| All seat positions shall have a bright red retractable 3-point lap and shoulder harness, providing additional safety and security for personnel. Extensions shall be provided with the seat belts so the male end can be easily grasped and the female end easily located while sitting in a normal position. |  |  |  |
| A SecureAll™ SCBA locking system which shall be one bracket model and store all 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 |  |  |  |
| * A 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. |  |  |  |
| Each rear facing outer seat shall be mounted facing the rear of the cab. |  |  |  |
| The seats shall include a covering of high strength, wear vinyl. They shall be black in color |  |  |  |
| The seat back shall include the fire department logo. The logo shall be centered on the standard headrest of the seat back. |  |  |  |
| Technical specifications | Conform  Yes No | | Comments |
| 1. **FORWARD FACING OUTER SEAT:**   Two (2) forward facing outer seats shall be Bostrom flip-up seats and shall feature all the seat belts within the seat (ABTS). The seat shall come with a parade panel if equipped with an SCBA. |  |  |  |
| The seat shall be an HO Bostrom Tanker 450 series seat. The seat shall include an SCBA storage area with one piece flip-up headrest with spring return. The seat shall include two-part bolster padding with removable insert to accommodate SCBA's with rigid waist belts.  A SecureAll™ SCBA locking system which shall be one bracket model and store all 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 |  |  |  |
| * A 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 seats shall include a covering of high strength, wear vinyl. Thy shall be black in color. |  |  |  |
| The seat back shall include the fire department logo. The logo shall be centered on the standard headrest of the seat back. |  |  |  |
| Technical specifications | Conform  Yes No | | Comments |
| 1. **SEAT FRAME FORWARD FACING ENCLOSED:**   The forward facing outer seats shall include enclosed seat frames which are located and installed on the rear wall on both the driver and officer side. |  |  |  |
| Each seat frame shall be constructed of no less than 5052-H32 .1620" thick aluminum plate. |  |  |  |
| Technical specifications | Conform  Yes No | | Comments |
| 1. **EXTERIOR GRAB HANDLES:**   One (1) 18” anti-slip exterior assist handle shall be mounted behind each of the cab doors.  The grab handle shall be constructed of aluminum and be 1.25” diameter with a knurled finish enabling non-slip assistance with a gloved hand and mounted on stanchions. |  |  |  |
| The grab handles shall have **LED** lighting intergraded in the handle. |  |  |  |
| Technical specifications | Conform  Yes No | | Comments |
| 1. **SCUFF PLATE:**   The grab handles shall include a stainless-steel scuff plate to protect painted surfaces. |  |  |  |
| All door handles shall include a stainless-steel scuff plate to protect painted surfaces. |  |  |  |
| Technical specifications | Conform  Yes No | | Comments |
| 1. **CAB FASCIA:**   The cab fascia shall offer a traditional, yet aggressive appearance, in its design and shall be constructed of work-hardened 5052-H32 aluminum. This design shall feature: |  |  |  |
| * A super structure which is fully welded to the cab, for a seamless and robust integration |  |  |  |
| * Headlamp bezels with black Linex package |  |  |  |
| * Traditional style headlight bezels with 4 x 6 high intensity headlights which shall add a classic look to the fascia while improving visibility |  |  |  |
| Technical specifications | Conform  Yes No | | Comments |
| 1. **FRONT GRILLE:**   A prominent front grille shall punctuate the aggressive design of the cab with its outboard wing style warning light bezels and heavy framework. The front grille shall feature: |  |  |  |
| * Black Linex for an aesthetically pleasing appearance * The name of the community shall be on the front grill and if possible be lite up. |  |  |  |
| Technical specifications | Conform  Yes No | | Comments |
| 1. **LIGHT BEZEL:**   The front grille shall include wing light bezels. The bezels shall be black. |  |  |  |
| Technical specifications | Conform  Yes No | | Comments |
| 1. **FRONT GRILLE INLAY:**   The front grille shall include a honeycomb inlay and shall be black, which shall provide air flow to through the grille and provide a sporty, muscular appearance to the front of the apparatus. |  |  |  |
| Technical specifications | Conform  Yes No | | Comments |
| 1. **FLUID FILLS & CHECK:**   For ease of maintenance and access, the following fluid checks shall be located behind the tiltable and/or removable mesh panel: |  |  |  |
| * Engine Oil dipstick |  |  |  |
| * Engine Coolant Sight Glass |  |  |  |
| * Power Steering Fluid dipstick |  |  |  |
| * Windshield Washer Fluid |  |  |  |
| The following fluid fill shall be located behind the tiltable and/or removable mesh panel: |  |  |  |
| * Engine Oil for the Engine only |  |  |  |
| * Power Steering |  |  |  |
| * Windshield Washer |  |  |  |
| Proposals including access to fluid checks through the tunnel or by raising the cab shall not be considered. |  |  |  |
| Technical specifications | Conform  Yes No | | Comments |
| 1. **LED HEADLIGHTS:**   A quadruple headlight assembly shall be provided in the fascia to enhance the look. The shall be LED high and low head lamps |  |  |  |
| Technical specifications | Conform  Yes No | | Comments |
| 1. **DAYTIME RUNNING LIGHTS:**   The daytime running light feature shall include the headlights on low beam and the marker lights shall be illuminated and a wig-wag or alternating feature. |  |  |  |
| Technical specifications | Conform  Yes No | | Comments |
| 1. **HEADLIGHT FLASHER:**   Deliberate operator selection of high beams will override the flashing function until low beams are again selected. Per **NFPA**, these clear flashing lights will also be disabled “On Scene” when the park brake is applied. |  |  |  |
| Technical specifications | Conform  Yes No | | Comments |
| 1. **HEADLIGHT FLASHER SWITCH:**   The alternating high beam headlamp switch shall be located on the driver console. |  |  |  |
| Technical specifications | Conform  Yes No | | Comments |
| 1. **HEADLIGHT LOCATION:**   The headlights shall be located on the front fascia in the upper buckets, on each side of the cab grille. |  |  |  |
| Technical specifications | Conform  Yes No | | Comments |
| 1. **FRONT TURN SIGNALS:**   There shall be a pair of Whelen **model M6 LED** turn signal light heads with populated arrow pattern and amber lens mounted lower headlight bezel and wired with weatherproof connectors. |  |  |  |
| Technical specifications | Conform  Yes No | | Comments |
| 1. **TURN SIGNAL LOCATION:**   The turn signals shall be located on the front fascia directly below the headlights, one each side of the cab grille. |  |  |  |
| Technical specifications | Conform  Yes No | | Comments |
| 1. **SIDE MARKER LIGHTS:**   Two (2) amber LED round, side marker light assemblies shall be mounted on the side of the cab ahead of the driver door, adjacent to the front head lamp bezel. |  |  |  |
| Technical specifications | Conform  Yes No | | Comments |
| 1. **HEADLIGHT AND MARKER LIGHT ACTIVATION:**   The head light and marker lights shall be activated through a switch on the driver's panel. |  |  |  |
| Technical specifications | Conform  Yes No | | Comments |
| 1. **FRONT MARKER LAMPS:**   The cab front shall include five (5) LED amber marker lamps above the windshield in accordance with the Department of Transportation requirements. |  |  |  |
| Technical specifications | Conform  Yes No | | Comments |
| 1. **CAB FENDERS:**   The cab wheel wells shall include full width, rubber cab fenders to resist corrosion and enable easier cleaning maintenance. The inner liner, measuring 18" wide shall be constructed of plastic with an outer fenderette measuring at least 2.5" wide. |  |  |  |
| Technical specifications | Conform  Yes No | | Comments |
| 1. **CAB DOME LIGHTS:**   Four (4) ceiling mounted dome light assemblies shall be provided. |  |  |  |
| Each light shall consist of a three-position assembly mounted rocker switch, LED (light emitting diode) 4” grommet mount white dome light, LED (light emitting diode) 4” grommet mount red dome light, and a plastic housing.  The white light activates with appropriate cab door and light assembly mounted rocker switch, the red light activates with assembly mounted rocker switch only. |  |  |  |
| Two (2) lights shall be located in both the front and rear of the cab. |  |  |  |
| The lights shall have a white function and a blue function. |  |  |  |
| Technical specifications | Conform  Yes No | | Comments |
| 1. **FRONT MUD FLAPS:**   The cab and chassis shall be provided with rubber front mud flaps. |  |  |  |
| Technical specifications | Conform  Yes No | | Comments |
| 1. **REARVIEW MIRRORS:**   Two (2) Ramco model 6001FFR remote controlled aluminum mirrors shall be installed. The mirrors shall incorporate a full face main section with a convex mirror with housing model CAS750, mounted to the top. The adjustment of main sections shall be through dash mounted switches. Location: mounted on front corners of cab.  The cab mirrors shall be black. |  |  |  |
| The cab mirrors shall be heated. |  |  |  |
| The cab mirrors shall be electric controlled. |  |  |  |
| There shall be a 2” extension provided for each Ramco mirror. |  |  |  |
| Technical specifications | Conform  Yes No | | Comments |
| 1. **REARVIEW MIRROR REMOTE ACTIVATION:**   The driver's panel shall include activation for the rearview mirrors remote function. The driver panel shall also include a switch activating the mirrors to be heated. |  |  |  |
| Technical specifications | Conform  Yes No | | Comments |
| 1. **CAB TWO TONE PAINT:**   The cab surface shall be thoroughly washed with grease cutting solvent prior to any sanding. The cab surface shall then be sanded, and minor imperfections filled and sanded.  The prepared surface shall then be washed again with to remove any contaminants from all surfaces to be painted. |  |  |  |
| The first coating to be applied shall be a pre-treat epoxy primer (.5 to 1.0 dry film build) for maximum adhesion to the body material. The next two to four coats shall be a polyurethane primer resurfacing agent (PPG F4936). The film build shall be 4-6 mils when dry. The primer coat, after appropriate dry time, shall be sanded with 320-600 grit sandpaper to ensure a maximum gloss finish. The last step shall be an application of at least three coats of PPG FDG polyurethane two-component color (single stage). The film build shall be 2-3 mils when dry. The single stage polyurethane shall provide a UV barrier to prevent fading and chalking. |  |  |  |
| The cab shall then be painted with the specific colors designated by the customer with a minimum thickness of 2.00 mils of finished paint, followed by a clear top coat not to exceed 2.00 mils.  **The cag shall be two tones and include a provision for bandit style.** |  |  |  |
| The color codes shall be supplied at the pre-production meeting. |  |  |  |
| Technical specifications | Conform  Yes No | | Comments |
| 1. **CAB PAINT EXTERIOR BREAKLINE:**   The upper and lower paint shall meet on the cab which shall start at the grille under the wings and travel 6" below the cab windshield and approximately 5" under the driver and passenger and crew door windows. |  |  |  |
| Technical specifications | Conform  Yes No | | Comments |
| 1. **CAB UNDERCOAT:**   The cab shall have an undercoat applied prior to the cab being set on the running gear. The under coat shall be a waterborne, one-component, air dry undercoat formulated to prevent chipping, cracking and marring of painted or unpainted surfaces after exposure to high impact sand, gravel or other abrasive materials. It shall also have high corrosion resistance. |  |  |  |
| Technical specifications | Conform  Yes No | | Comments |
| 1. **FRONT AXLE:**   The vehicle shall utilize an **EZ TRAC** hydraulic drive drop beam front axle system with a rated capacity of 20,000 lbs. The **EZ TRAC** hydraulic All Wheel Drive (AWD) system is designed to provide hydraulic front wheel drive for operation at low ground speeds in poor traction conditions. |  |  |  |
| The axle shall be of I-beam construction and utilize oil-lubricated wheel bearings. The vehicle shall have a nominal cramp angle of 42 degrees including front suction applications.  The front axle hubs shall be made from ductile iron and shall be designed for use with 10-hole hub-piloted wheels in order to improve wheel centering and extend tire life.  The front axle hubs shall have hydraulic driver wheel motors that deliver up to 110 horse power (total). |  |  |  |
| The front axle shall have Stemco oil seals with sight glass to check the lubricant level of the axle spindles. |  |  |  |
| Technical specifications | Conform  Yes No | | Comments |
| 1. **FRONT SUSPENSION:**   The front springs shall be semi-elliptical, minimum 4” wide x 54” long (flat), ten (10) leaf, constant rate with bronze bushings and a capacity of 20,000 lbs. at the ground. |  |  |  |
| Technical specifications | Conform  Yes No | | Comments |
| 1. **FRONT SHOCK ABSORBERS:**   Koni model 90 shock absorbers shall be provided for the front axle. The shocks shall be three way adjustable.  The shocks shall be covered by the manufacturer`s standard warranty. |  |  |  |
| Technical specifications | Conform  Yes No | | Comments |
| 1. **POWER STEERING GEAR WITH ASSIST:**   The vehicle shall be equipped with a Sheppard integral model M-110 power steering gear, used in conjunction with a power assist cylinder. The steering assembly shall be rated to statically steer up to a maximum front axle load of 20,000 lbs. Relief stops shall be provided to reduce system pressure upon full wheel cut.  system shall operate mechanically should the hydraulic system fail. |  |  |  |
| Technical specifications | Conform  Yes No | | Comments |
| 1. **HYDRAULIC SYSTEM:**   The hydraulic system shall be powered by a transmission mounted power take off (PTO). The hydraulic pump shall be capable of flowing up to 80 GPM. |  |  |  |
| The hydraulic system shall have an eleven (11) gallon reservoir. |  |  |  |
| An air to oil heat exchanger shall be provided for the hydraulic system. The heat exchanger shall have a 1082 CFM fan. |  |  |  |
| **CONTROL MODULE**  The system shall have a control module that reads chassis information directly from the **J1939 CAN.** |  |  |  |
| The front hubs shall be able to be engaged while driving in either 1st gear or reverse. If the apparatus shifts into second gear the system shall disengage yet remain in a standby mode (depending on the programmed maximum standby mode speed).  When the system is engaged, a continuous torque set up in the electronics (20 - 50% of max) is applied to the front wheels in full traction conditions. When the rear wheels slip, the front torque shall be allowed to increase to 100%. |  |  |  |
| **A 2-year/unlimited miles’ parts and 2-year labor warranty shall be provided for the axle.** |  |  |  |
| Technical specifications | Conform  Yes No | | Comments |
| 1. **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 apparatus manufacturer. |  |  |  |
| Alignment documentation shall be available upon request. |  |  |  |
| Technical specifications | Conform  Yes No | | Comments |
| 1. **FRONT AXLE CRAMP ANGLE:**   The chassis shall have a front axle cramp angle of 35 degrees to the left and right. |  |  |  |
| Technical specifications | Conform  Yes No | | Comments |
| 1. **FRONT TIRES:**   The front tires shall be Michelin 425 65R 22.5 20PR “L” tubeless radial XZY3 mixed service tread. |  |  |  |
| The front tires shall feature:   * A stamped load capacity of 22,800 pounds per axle with a speed capacity of 65 miles per hour when properly inflated to 120 pounds per square inch |  |  |  |
| Technical specifications | Conform  Yes No | | Comments |
| 1. **FRONT WHEEL:**   The front wheels shall be aluminum hub-piloted disc sized appropriately for the tires.  The wheels shall be painted black in color |  |  |  |
| The front wheels shall have lug nut covers (for use with aluminum wheels) |  |  |  |
| The front axle shall be covered with mirror finish, 304L grade, non-corrosive stainless universal baby moons. |  |  |  |
| Technical specifications | Conform  Yes No | | Comments |
| 1. **BRAKE SYSTEM:**   The vehicle shall be equipped with air-operated brakes and an anti-lock braking system (ABS). The brake system shall meet or exceed the design and performance requirements of the current Federal Motor Vehicle Safety Standard **(FMVSS)-121**, and the test requirements of the current **NFPA 1901** Standard. |  |  |  |
| A dual-treadle brake valve shall correctly proportion the braking power between the front and rear systems. The air system shall be provided with a rapid pressure build-up feature, designed to meet current **NFPA 1901** requirements, to allow the vehicle to begin its emergency response as quickly as possible.  A pressure-protection valve shall be installed to prevent use of the air horns or other air-operated devices should the air system pressure drop below 85 psi. This feature is designed to prevent inadvertent actuation of the emergency/parking brakes while the vehicle is in motion. |  |  |  |
| Two (2) air pressure needle gauges, one (1) each for front and rear air pressure, with a warning light and buzzer shall be installed at the driver`s instrument panel. |  |  |  |
| The braking system shall be provided with a minimum of three (3) air tank reservoirs for a total air system capacity of 5,214 cu. in. One (1) reservoir shall serve as the wet tank and a minimum of one (1) tank shall be supplied for each of the front and rear axles.  The total system shall carry a sufficient volume of air to comply with FMVSS-121. |  |  |  |
| **Tank Capacities in Cubic Inches:**  **Wet Front Rear Total**  **1,738 1,738 1,738 5,214** |  |  |  |
| Spring-actuated emergency/parking brakes shall be installed on the rear axle. |  |  |  |
| A Bendix-Westinghouse SR-1 valve, in conjunction with a double check valve system, shall provide automatic emergency brake application when the air brake system pressure falls below 40 psi in order to safely bring the vehicle to a stop in case of an accidental loss of braking system air pressure |  |  |  |
| A four-channel Wabco ABS shall be provided to improve vehicle stability and control by reducing wheel lock-up during braking. This braking system shall be fitted to both front and rear axles. All electrical connections shall be environmentally-sealed for protection against water, weather, and vibration. |  |  |  |
| The system shall constantly monitor wheel behavior during braking. Sensors on each wheel transmit wheel speed data to an electronic processor, which shall detect approaching wheel lock-up and instantly modulate (or pump) the brake pressure up to five (5) times per second to prevent wheel lock-up. Each wheel shall be individually controlled. To improve field performance, the system shall be equipped with a dual-circuit design configured in a diagonal pattern. Should a malfunction occur in one circuit, that circuit shall revert to normal braking action. A warning light at the driver`s instrument panel shall signal a malfunction.  The system shall also be configured to work in conjunction with all auxiliary engine, exhaust, or driveline brakes to prevent wheel lock-up.  To improve maintenance troubleshooting, provisions in the system for an optional diagnostic tester shall be provided. The system shall test itself each time the vehicle is started, and a dash-mounted light shall go out once the vehicle is moving above 4 MPH. |  |  |  |
| A 3 year/300,000 mile parts and labor Anti-Locking Braking System (ABS) warranty shall be provided as standard by Meritor Automotive. |  |  |  |
| Technical specifications | Conform  Yes No | | Comments |
| 1. **PARK BRAKE SYSTEM:**   One (1) Bendix-Westinghouse PP-5 parking brake control valve shall be supplied on the lower dash panel within easy reach of the driver.  Parking Brake Front Axle |  |  |  |
| A front axle parking brake system shall be provided. Utilizing a separate dash mounted activation switch, the system shall apply the front axle service brake. The system shall be interlocked to the main axle rear axle parking brake system control, so as to be operational only when the main system brakes are applied. A dash mounted warning tag shall be provided, stating;” Low air system pressure reduces or eliminates braking force.” |  |  |  |
| Technical specifications | Conform  Yes No | | Comments |
| 1. **FRONT BRAKES:**   The front axle shall be equipped with Meritor DiscPlus EX225H 17-inch disc brakes.  The brakes shall be covered by the manufacturer`s standard warranty which is three years, unlimited mileage and parts only. |  |  |  |
| Technical specifications | Conform  Yes No | | Comments |
| 1. **STEERING COLUMN AND WHEEL:**   The cab shall include a Douglas Autotech steering column. The steering column shall feature an 18”, four (4) spoke steering wheel located at the driver’s position; a five (5) position tilt and 2.25” telescopic adjustment.  The steering wheel shall be provided with a black vinyl cover with foam padding and a horn button, self-canceling turn signal switch, four-way hazard switch and headlamp dimmer switch. |  |  |  |
| The chassis shall include dual electric 12-volt horn with a minimum 110 decibels. |  |  |  |
| Technical specifications | Conform  Yes No | | Comments |
| 1. **REAR AXLE:**   The vehicle shall utilize an ArvinMeritor RS-30-185 single rear axle with single reduction hypoid gearing and a manufacturer`s rated capacity of 33,000 lbs. The axle shall be equipped with oil-lubricated wheel bearings with ArvinMeritor oil seals. |  |  |  |
| The rear axle hubs shall be made from ductile iron and shall be designed for use with 10-hole hub-piloted wheels to improve wheel centering and extend tire use. |  |  |  |
| A 2-year/unlimited miles’ parts and 2-year labor rear axle warranty shall be provided as standard by ArvinMeritor Automotive. |  |  |  |
| A Rockwell driver controlled main differential full lock shall be supplied. Operated from within the cab, it reduces wheel spin-outs by transferring power from the slipping wheel to the wheel with traction. An indicator shall be provided visible to the driver to show when the lock is engaged.  When used in a tandem axle application, the DCDL will be installed on the rear/rear axle only. |  |  |  |
| Technical specifications | Conform  Yes No | | Comments |
| 1. **REAR AXLE DIFFERENTIAL LUBRICATION:**   The rear axle differential shall be lubricated with oil. The oil shall be synthetic |  | |  |
| Technical specifications | Conform  Yes No | | Comments |
| 1. **REAR WHEEL BEARING LUBRICATION:**   The rear axle wheel bearings shall be lubricated with oil. |  |  |  |
| Technical specifications | Conform  Yes No | | Comments |
| 1. **REAR SUSPENSION:**   The rear suspension shall be a Reyco model 79KB. The suspension shall include linear-rate slipper type leaf springs that eliminate spring eyes and shackles.  The suspension shall also include auxiliary "helper" leaf springs, one (1) fixed torque arm, one (1) adjustable torque arm and cast spring hangers. The suspension shall be rated for 33,000 lbs. |  |  |  |
| Technical specifications | Conform  Yes No | | Comments |
| 1. **REAR BRAKES:**   The rear axle shall be equipped with ArvinMeritor 16.5” x 8.625” P-Cast S-cam brakes with cast brake shoes. The brakes shall be furnished with Haldex automatic slack adjusters. |  |  |  |
| A 3 year/unlimited miles parts and 3 year labor rear brake warranty shall be provided as standard by ArvinMeritor Automotive.  The warranty shall include bushings, seals, and cams. |  |  |  |
| Technical specifications | Conform  Yes No | | Comments |
| 1. **REAR BRAKE DUST SHIELDS:**   The rear brakes shall be equipped with brake dust shields |  |  |  |
| Technical specifications | Conform  Yes No | | Comments |
| 1. **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. |  |  |  |
| Technical specifications | Conform  Yes No | | Comments |
| 1. **REAR SHOCK ABSORBERS:**   Shock absorbers shall be supplied by the suspension manufacturer and installed on the rear axle suspension. |  |  |  |
| Technical specifications | Conform  Yes No | | Comments |
| 1. **REAR TIRE:**   The rear tires shall be Michelin 315R22.5 tubeless type radial tires with XDN2 all weather tread.  The tires with wheels shall have the following weight capacity:  33,080 lbs. (dual) @ 75 MPH.  The wheels and tires shall conform to the Tire and Rim Association requirements |  |  |  |
| Technical specifications | Conform  Yes No | | Comments |
| 1. **REAR WHEELS:**   There shall be four hub-piloted Aluminium disc wheels sized appropriately for the tires.  The outer wheel shall be painted black |  |  |  |
| The rear wheels shall have stainless steel lug nut covers (chrome plated steel lug nut covers not acceptable), or chrome plated plastic lug nut covers. |  |  |  |
| The rear axle shall be covered with mirror finish, 304L grade, non-corrosive stainless steel, spring clip band mount high hats, DOT user friendly. |  |  |  |
| All stainless steel high hats shall carry a lifetime warranty plus a 2-year re-buffing policy. There shall be two (2) high hats and twenty (20) lug nut covers. |  |  |  |
| Technical specifications | Conform  Yes No | | Comments |
| 1. **REAR MUD FLAPS:**   One (1) pair of black mud flaps shall be installed behind the rear wheels. |  |  |  |
| Technical specifications | Conform  Yes No | | Comments |
| 1. **TIRE BALANCING:**   There shall be counter acting balancing beads used in all of the tires |  |  |  |
| Technical specifications | Conform  Yes No | | Comments |
| 1. **VALVE STEM EXTENSION - SINGLE AXLE:**   To allow for easy checking and inflation of the rear inner tire it shall be equipped with a multi-layer valve stem extension, the layers shall be as follows: starting from the inner to out layer, stainless steel metal core, air tube, stainless steel jacket, protective color |  |  |  |
| Technical specifications | Conform  Yes No | | Comments |
| 1. **TIRE PRESSURE INDICATOR:**   There shall be a tire pressure indicator at each tire’s valve stem on the vehicle that shall  indicate if there is insufficient pressure in the specific tire. |  |  |  |
| Technical specifications | Conform  Yes No | | Comments |
| 1. **VEHICLE TOP SPEED:**   The top speed of the vehicle shall be programmed at approximately 65 MPH +/-2 MPH at governed engine RPM. |  |  |  |
| Technical specifications | Conform  Yes No | | Comments |
| 1. **AIR TANK BRACKETS & STRAPS:**   The air tank(s) shall be mounted to the frame rail with brackets that are hot dipped galvanized thereby creating a barrier and cathodic protection from corrosion, and eliminating the requirement for finish paint and the subsequent requirements for touch up paint and/or total repaint after a period of time due to nicks, chips and corrosion. Powder coated or painted air tank brackets shall not be accepted. No exception.  All of the air tank straps shall be plastic coated stainless steel cable. **NO EXCEPTION.** |  |  |  |
| Technical specifications | Conform  Yes No | | Comments |
| 1. **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 system shall include an anti-compounding feature. |  |  |  |
| Technical specifications | Conform  Yes No | | Comments |
| 1. **PARK BRAKE CONTROL:**   A Meritor-Wabco manual hand control push-pull style valve shall operate the parking brake system. The control shall be yellow in color. |  |  |  |
| The parking brake actuation valve shall be mounted on the driver's side dash to the right of the steering column within easy reach of the driver. |  |  |  |
| Technical specifications | Conform  Yes No | | Comments |
| 1. **AIR DRYER:**   The chassis air system shall be equipped with a Meritor/Wabco System Saver 1200 air dryer located under the cab. The air dryer shall utilize a single spin-on desiccant cartridge. |  |  |  |
| Technical specifications | Conform  Yes No | | Comments |
| 1. **AUXILIARY AIR TANK:**   An auxiliary air tank shall be installed on the chassis to act as an additional reserve supply to the air system for the air horn, any air tools, or other non-service brake use. |  |  |  |
| The reservoir shall offer a 1700 cubic inch reservoir, isolated with a 90 PSI pressure protection valve on the reservoir supply side to prevent depletion of the air to the air brake system. |  |  |  |
| A 1/4” brass quick-release air inlet with a male connection shall be provided. The inlet shall allow a shoreline air hose to be connected to the vehicle, discharging air directly into the wet tank of the air brake system. It shall be located driver door jamb. |  |  |  |
| Technical specifications | Conform  Yes No | | Comments |
| 1. **MOISTURE EJECTORS:**   Heated, automatic moisture ejectors with a manual drain provision shall be installed on all reservoirs of the air supply system. The manual drain provision shall include an actuation pull cable coiled and tied at each drain valve. The supplied cables when extended shall be sufficient in length to allow each drain to be activated from the side of the apparatus. |  |  |  |
| Five (5) cable from the spring-loaded air tank drain shall be routed and attached to the outer edge of the apparatus for ease of access. The 1/8" braided steel cable shall allow accumulated moisture in the air brake system to be easily drained. The cable shall be installed so that maximum ground clearance is maintained. |  |  |  |
| Technical specifications | Conform  Yes No | | Comments |
| 1. **AIR SUPPLY LINES:**   Air brake lines shall be constructed of color-coded nylon tubing routed in a manner to protect them from damage. Brass fittings shall be provided. |  |  |  |
| Technical specifications | Conform  Yes No | | Comments |
| 1. **FRAME:**   The frame shall consist of two (2) C-channel frame rails with heavy-duty cross-members. Each frame rail shall have the following minimum specifications in order to minimize frame deflection under load and thereby improve vehicle ride and extend the life of the frame: |  |  |  |
| Dimensions: 10-1/4” x 3-1/2” x 3/8”  Material: 110,000-psi minimum yield strength, high strength, low alloy steel  Section Modulus: 16.61 cu. in. |  |  |  |
| Resistance to Bending Moment (RBM): 1,827,045 in. lbs. |  |  |  |
| If larger rails are provided, the maximum height of each frame rail shall not exceed the 10-1/4” dimension by more than 1/2” in order to ensure the lowest possible body height for ease of access as well as the lowest possible vehicle center of gravity for maximum stability. |  |  |  |
| There shall be a minimum of six (6) cross-members joining the two (2) frame rails in order to make the frame rigid and hold the rails/liners in alignment. The cross-members shall be a combination of a formed steel C-channel design along with heavy duty steel fabricated designs as required for the exact chassis configuration.  The cross-members shall be attached to the frame rails with not less than four (4) bolts at each end arranged in a bolt pattern to adequately distribute the cross-member load into the rail/liner and minimize stress concentrations.  All frame fasteners shall be high-strength Grade 8, flanged-head threaded bolts and nuts for frame strength, durability, and ease of repair. The nuts shall be Stover locknuts to help prevent loosening. The frame fasteners shall be tightened to the proper torque at the time of assembly. |  |  |  |
| The frame rails shall be zinc plated (galvanized) and powder coated for improved corrosion resistance. The galvanization shall be a minimum of 4 mils thick and done in accordance with **ASTM A123**. The powder coat shall be 6.5 mils thick (+/- 1.5 mils) and pass **ASTM D3359** testing. |  |  |  |
| The frame cross-members and frame mounted components (suspensions, axles, air tanks, battery boxes, fuel tank, etc.) shall be painted black. |  |  |  |
| The apparatus manufacturer shall supply a full lifetime frame warranty including cross-members against defects in materials or workmanship. Warranties that provide a lifetime warranty for only the frame rails, but not the cross-members, are not acceptable. **NO EXCEPTIONS.** |  |  |  |
| The custom chassis frame shall have a **WHEEL ALIGNMENT** in order to achieve maximum vehicle road performance and to promote long tire life. The alignment shall conform to the manufacturer`s internal specifications. All wheel lug nuts and axle U-bolt retainer nuts shall be tightened to the proper torque at the time of alignment. The wheel alignment documentation shall be made available at delivery upon request. |  |  |  |
| A 9-3/8” x 3-1/8” x 3/8” channel frame liner shall be bolted to each frame rail for added strength and rigidity. Frame liners shall be made of 110,000 psi minimum yield, high strength, low alloy steel. The frame rails shall be zinc plated (galvanized) and powder coated for improved corrosion resistance. |  |  |  |
| The galvanization shall be a minimum of 4 mils thick and done in accordance with ASTM A123. The powder coat shall be 6.5 mils thick (+/- 1.5 mils) and pass ASTM D3359 testing.  Each frame rail with liner shall have the following minimum characteristics:  Section Modulus: 28.74 cu. in.  RBM: 3,161,400 in. lbs. |  |  |  |
| The frame liners shall be inserted inside the open portion of the frame rails and shall run continuously from the rear of the frame to the centerline of the front axle to provide maximum frame strength at all critical load points. |  |  |  |
| Technical specifications | Conform  Yes No | | Comments |
| 1. **FRAME FINISH:**   Prior to assembly, each frame rail section and cross members shall be hot dip galvanized. The galvanizing process will permeate each frame section to prevent rust and corrosion and not be merely an over-coating. The galvanized frame sections shall be provided in the natural finish eliminating the requirement for finish paint and the subsequent requirements for touch up paint and/or total repaint after a period of time due to nicks, chips and corrosion. |  |  |  |
| Galvanizing shall provide a barrier and cathodic protection from corrosion. During the galvanizing process, the complete frame sections and cross members shall be immersed in molten zinc; except for the cross member that contains the engine mounts. Through diffusion, the zinc shall bond to the steel at the molecular level. The resulting zinc coating shall provide a barrier that shields the steel from the environment. |  |  |  |
| Technical specifications | Conform  Yes No | | Comments |
| 1. **FRONT FRAME EXTENSION FINISH:**   The front frame extension shall be hot dipped galvanized to resist weather, dirt and other corrosive material. |  |  |  |
| Proposals offering powder coated or painted frames shall not be accepted. **No Exceptions** |  |  |  |
| Technical specifications | Conform  Yes No | | Comments |
| 1. **BUMPER:**   The chassis shall feature a heavy-duty bumper constructed from ASTM A36, 1/4" thick steel and painted primary job color. The bumper shall be 12" high with two inch (2") flanges and chamfered corners. |  |  |  |
| Integral heavy duty steel bumper "wings" shall extend from the bumper to the cab. |  |  |  |
| The bumper shall be mounted to a sixteen inch (16") long chassis frame extension. |  |  |  |
| A contoured apron / gravel shield fabricated from NFPA compliant, slip-resistant aluminum shall enclose the area between the bumper and the cab.  It shall include a black Linex package. |  |  |  |
| The front bumper shall have Diamond Grade reflective chevron installed. The chevron style striping shall be applied at a 45-degree upward angle.  The bumper extension shall be approximately 4” from the face of the cab as required. |  |  |  |
| Technical specifications | Conform  Yes No | | Comments |
| 1. **FRAME GALVANIZING WARRANTY:**   The bidder shall warrant the galvanized frame rails shall be warranted for a period of twenty 20 years and includes the following coverage: |  |  |  |
| * The galvanized surfaces of the frame rails and cross members shall be free from corrosion caused by dissimilar metals, adhesion, blistering or peeling. |  |  |  |
| * The galvanized surfaces of the frame rails and cross members shall be free from any corrosion perforation. |  |  |  |
| Under this warranty the bidder agrees to repair or refinish any galvanized surface that has been found to have a defect caused by defective manufacturing methods or galvanized material where there is no indication of abuse, neglect, unusual or other than normal service providing that such item or items are, at the option of the bidder, made available for inspection at their request, returned to their factory or other location designated by the bidder with transportation prepaid within thirty days after the date of failure or within twenty years from the date of delivery of the apparatus to the original purchaser, whichever occurs first, and inspection indicates the failure was attributed to a defect caused by defective manufacturing methods or galvanized material selection. Written authorization for repair or item replacement must be sought from the bidder’s customer service prior to the repair or item replacement occurring. |  |  |  |
| **Coverage Period**  **0 – 10 years = 100%**  **11 – 15 years = 50%**  **16 – 20 years = 25%** |  |  |  |
| This warranty shall not apply to or cover:   * Normal maintenance services including clean and repair of surface corrosion caused by normal road salt/chemicals or debris contacting the frame rails and cross members. |  |  |  |
| * Damage to the galvanized frame rails caused by exposure to severe environmental or chemical conditions or acidic environment. |  |  |  |
| * Any item that has been repaired, replaced or altered by a facility not approved in advance by the bidder or in a manner which, the bidder’s discretion, may adversely affect the safe operation or durability of the vehicle or item. |  |  |  |
| * Any malfunction resulting from misuse,   negligence, alteration, accident or lack of operational knowledge, lack of normal or required maintenance or adjustments, fire or acts of God. |  |  |  |
| Technical specifications | Conform  Yes No | | Comments |
| 1. **TOW HOOKS:**   Two (2) tow hooks shall be mounted to the bumper extension under the bumper towards the forward section of the extension. The tow hooks shall be steel and shall be powder coated black. |  |  |  |
| Technical specifications | Conform  Yes No | | Comments |
| 1. **REAR TOWING PROVISIONS:**   There shall be two tow eyes furnished under the rear of the body and attached directly to the chassis frame rails. There shall be a reinforcement spreader bar connecting the two tow eyes. Tow eyes are to be constructed of 3/8" plate steel with a 4" I.D. hole, large enough for passing through a tow chain end hook. |  |  |  |
| Technical specifications | Conform  Yes No | | Comments |
| 1. **ENGINE:**   A Cummins L 9.0 liter, 6 cylinders diesel fueled, turbo charged engine shall feature the following: |  |  |  |
| * One of the highest power to weight ratios in its class |  |  |  |
| * Heavy-duty replaceable wet liners, roller followers, by-pass oil filtration with replaceable spin on cartridge and targeted piston cooling for longer service in tough work environments |  |  |  |
| * Improved cooled EGR system |  |  |  |
| * 543 Cubic inches of displacement |  |  |  |
| * High pressure common rail fuel system producing a precise quantity of fuel at ultra high pressures |  |  |  |
| * Fully integrated, robust electronic engine controls |  |  |  |
| * Electric fuel lift pump. |  |  |  |
| The engine shall be coupled with a Holset VGT™ (Variable Geometry Turbocharger). |  |  |  |
| The engine shall be filled with Citgo brand Citgard 500 (or equivalent) SAE 15W40 CJ4 low ash engine oil for proper engine lubrication. |  |  |  |
| The engine shall be EPA certified to meet the 2017 emissions standards without compromising performance, reliability or durability using cooled exhaust gas recirculation and selective catalytic reduction technology. |  |  |  |
| The engine shall include an original equipment manufacturer installed oil drain plug. |  |  |  |
| The engine shall include programming which will govern the top speed of the vehicle. |  |  |  |
| The engine shall have 450 horsepower at 2100 RPM, with a governed speed of 2200 RPM. |  |  |  |
| The engine shall have 1250 foot pounds of torque at 1400 RPM. |  |  |  |
| Technical specifications | Conform  Yes No | | Comments |
| 1. **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. |  |  |  |
| Technical specifications | Conform  Yes No | | Comments |
| 1. **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 integrated in the air dryer assembly. |  |  |  |
| Technical specifications | Conform  Yes No | | Comments |
| 1. **ENGINE FAN DRIVE:**   The engine cooling system fan shall incorporate a thermostatically controlled, one (1) piece nine (9) blade Horton clutched type fan drive, and shroud. |  |  |  |
| When the clutched fan is disengaged, it shall facilitate improved vehicle performance, cab heating in cold climates, and fuel economy. The fan clutch design shall be fail safe so that if the clutch drive fails, the fan shall engage to prevent engine overheating due to the fan clutch failure. |  |  |  |
| Technical specifications | Conform  Yes No | | Comments |
| 1. **CLUTCH FAN SWITCH:**   A switch on the dash shall be provided to turn the fan clutch on and off manually. The switch shall not function to turn off the fan when the fan is activated due to high coolant temperature. |  |  |  |
| The clutch fan shall be thermostatically controlled only or with manual fan clutch switch (when applicable). |  |  |  |
| Technical specifications | Conform  Yes No | | Comments |
| 1. **AUXILIARY ENGINE BRAKE:**   A Cummins engine compression brake, for the six (6) cylinder engine, shall be provided. The engine compression brake shall:   * Activate upon 0% accelerator when in operation mode |  |  |  |
| Technical specifications | Conform  Yes No | | Comments |
| 1. **TRANSMISSION PRE-SELECT:**   When the auxiliary brake is engaged, the transmission shall automatically shift to second gear to decrease the rate of speed. The transmission shall assist the secondary braking system, thereby slowing the vehicle. |  |  |  |
| Technical specifications | Conform  Yes No | | Comments |
| 1. **AUXILIARY ENGINE BRAKE CONTROL:**   An auxiliary engine 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 auxiliary brake shall be controlled through an on/off switch and individual low/medium/high selector switches on the Driver's panel. |  |  |  |
| Technical specifications | Conform  Yes No | | Comments |
| 1. **ENGINE BLOCK HEATER:**   A 1000 watt, 120-volt engine coolant heater with automatic thermostat shall be installed. The block heater shall be connected to the electrical inlet |  |  |  |
| The manual shoreline cover shall be Black in color. |  |  |  |
| Technical specifications | Conform  Yes No | | Comments |
| 1. **SHORELINE LOCATION:**   The shoreline shall be located in the Driver’s side bumper tail. |  |  |  |
| Technical specifications | Conform  Yes No | | Comments |
| 1. **ENGINE PROGRAMMING HIGH IDLE SPEED:**   The Engine high idle will be set at 1250 RPM.  The high idle will be operational only when the parking brake is set and the truck transmission is in neutral. |  |  |  |
| Technical specifications | Conform  Yes No | | Comments |
| 1. **ENGINE HIGH IDLE CONTROL:**   The vehicle shall be equipped with an automatic high-idle speed control. It shall be pre-set so when activated, it will operate the engine at the appropriate RPM to increase alternator output and optimize output of the HVAC system. |  |  |  |
| This device shall operate only when the master switch is activated and the transmission is in neutral with the parking brake set. The device shall disengage when the operator depresses the brake pedal, or the transmission is placed in gear, and shall be available to manually, through a switch, or automatically re-engage when the brake is set, or when the transmission is placed in neutral. |  |  |  |
| Technical specifications | Conform  Yes No | | Comments |
| 1. **ENGINE AIR INTAKE:**   The engine air intake shall draw air through the front cab grill. The intake opening shall be located on the officer (right) side behind front cab face with a plenum that directs air to the air filter. The air cleaner intake piping shall be made from aluminized steel tubing with flexible rubber hoses. The intake piping clamps shall be heavy-duty, constant-torque, T-bolt style to ensure proper sealing under all temperatures in order to keep dust and other contaminants out of the engine intake air stream and protect the engine. |  |  |  |
| The air cleaner shall be an 11” diameter K&N for lower restriction and high air flow. The filtration media shall be washable and easily accessed for service. |  |  |  |
| Technical specifications | Conform  Yes No | | Comments |
| 1. **ENGINE EXHAUST SYSTEM:**   The engine exhaust piping shall be a minimum of 4” diameter welded stainless steel tubing. The after-treatment system shall be mounted horizontally under the right-hand frame rail in back of the cab in order to minimize heat transmission to the cab and its occupants. The exhaust shall be directed away from the vehicle on the right side ahead of the rear wheels in order to keep exhaust fumes as far away as possible from the cab and pump operator position. |  |  |  |
| A 5-year/100,000-miles parts and labor warranty shall be provided as standard by Cummins. |  |  |  |
| A copy of the Engine Installation Review stating the engine installation meets Cummins recommendations shall be provided as requested. The engine installation shall not require the operation of any type of” power-down” feature to meet engine installation tests. |  |  |  |
| Technical specifications | Conform  Yes No | | Comments |
| 1. **EXHAUST HEAT SHIELD:**   A heat shield shall be installed under the body in the areas where the exhaust system is routed. |  |  |  |
| Technical specifications | Conform  Yes No | | Comments |
| 1. **DIESEL EXHAUST FLUID TANK:**   A diesel exhaust fluid (DEF) tank with a five (5) gallon capacity shall be provided. |  |  |  |
| The DEF tank shall include a heater fed by hot water directly from the engine block to prevent the DEF from becoming too cool to operate correctly per EPA requirements. The tank shall include a temperature sensor to control the heater control valve that controls the feed of hot water from the engine to the DEF tank heater.  A sender shall be provided in the DEF tank connected to a level gauge on the cab dash.  The tank shall be located R1 floor offset forward. |  |  |  |
| Technical specifications | Conform  Yes No | | Comments |
| 1. **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. |  |  |  |
| Technical specifications | Conform  Yes No | | Comments |
| 1. **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. |  |  |  |
| Technical specifications | Conform  Yes No | | Comments |
| 1. **DIESEL PARTICULATE FILTER CONTROLS:**   Provide **DPF** system status annunciation indicator lights,  lights shall be installed on driver dash to alert driver when regeneration is needed and when **DPF** is in an active re-generation cycle. |  |  |  |
| Warning systems shall provide **DEF** low level warning. |  |  |  |
| Driver's dash shall be provided with two (2) controls for the Diesel particulate filter; one (1) manual regeneration switch to activate a regeneration cycle manually when passive burn is unobtainable due to driving conditions; and one (1) Regen "Inhibit Switch". |  |  |  |
| The switches shall be located in a covered location. |  |  |  |
| Technical specifications | Conform  Yes No | | Comments |
| 1. **ENGINE COOLING SYSTEM:**   The radiator and the complete cooling system shall meet or exceed NFPA and engine manufacturer cooling system requirements. |  |  |  |
| The system shall include and feature the following: |  |  |  |
| * A vertically stacked charge air cooler providing the maximum cooling capacity for the engine. Proposals offering horizontally stacked charge air cooler shall not be acceptable. **No Exceptions** |  |  |  |
| * The charge air cooler and radiator shall measure not less than 1382 square inches |  |  |  |
| * A surge tank with a low coolant probe and capable of removing entrained air from the cooling system, with built in sight glass |  |  |  |
| * Radiator re-circulation shields to prevent heated air from re-entering the cooling system and affecting performance |  |  |  |
| * Mounts allowing the entire radiator to drop through the frame for service when needed |  |  |  |
| * Engine placement shall provide a minimum of 8” between the engine fan and radiator to maximize the airflow and cooling of the engine. |  |  |  |
| * A Spin on Element water filter with corrosion inhibitor shall be provided for the cooling system. |  |  |  |
| * The coolant filter shall be provided with two (2) shut off valves, one (1) one inlet and one (1) outlet. |  |  |  |
| * Cooling system shall be tested and certified by the engine manufacturer |  |  |  |
| Technical specifications | Conform  Yes No | | Comments |
| 1. **COOLANT HOSES:**   The cooling systems hose shall be formed silicone hose and formed aluminized steel tubing and include constant tension spring clamps. |  |  |  |
| Technical specifications | Conform  Yes No | | Comments |
| 1. **ENGINE COOLING PACKAGE:**   The cooling system shall include an aluminum tube-and-fin radiator with a minimum of 1,408 total square inches of frontal area to ensure adequate cooling under all operating conditions. There shall be a drain valve in the bottom tank to allow the radiator to be serviced. A sight glass shall be included for quick fluid level assessment. The radiator shall be installed at the prescribed angle in order to achieve the maximum operational effectiveness.  This shall be accomplished according to established work instructions and properly calibrated angle measurement equipment. |  |  |  |
| Silicone Hoses  All radiator and heater hoses shall be silicone. Pressure compensating band clamps shall be used to eliminate hose pinching on all hoses 3/4" diameter and larger. All radiator hoses shall be routed, loomed, and secured so as to provide maximum protection from chafing, crushing, or contact with other moving parts. |  |  |  |
| **Coolant:**  The cooling system shall be filled with a 50/50 mixture of water and antifreeze/coolant conditioner to provide freezing protection to minus 40 (- 40) degrees F for operation in severe winter temperatures. |  |  |  |
| **Coolant Recovery**  There shall be a coolant overflow recovery system provided.  Charge Air Cooler System  The system shall include a charge air cooler to ensure adequate cooling of the turbocharged air for proper engine operation and maximum performance. |  |  |  |
| **Charge Air Cooler Hoses**  Charge air cooler hoses shall be made from high-temperature, wire-reinforced silicone to withstand the extremely high temperatures and pressures of the turbocharged air. The hoses shall incorporate a flexible hump section to allow motion and misalignment of the engine relative to the charge air cooler. Charge air cooler hose clamps shall be heavy-duty, constant-torque, T-bolt clamps to ensure proper sealing under all temperatures in order to keep dust and other contaminants out of the engine intake air stream and protect the engine. |  |  |  |
| The fan shall be 30” in diameter with eleven (11) blades for maximum airflow and dynamic balance. It shall be made of nylon for strength and corrosion resistance. The fan shall be installed with grade 8 hardware which has been treated with thread locker for additional security. A fan shroud attached to the radiator shall be provided to prevent recirculation of engine compartment air around the fan in order to maximize the cooling airflow through the radiator. The fan shroud shall be constructed of fiber-reinforced high temperature plastic. The shroud shall be specifically formed with curved surfaces which improves air flow and cooling |  |  |  |
| Technical specifications | Conform  Yes No | | Comments |
| 1. **ADDITIONAL COOLANT SHUT OFF VALVE:**   An additional coolant shut off valve with connection shall be installed in the chassis coolant lines with a connector. This shall allow for the installation of an additional heater such as a pump compartment heater without draining the coolant system. |  |  |  |
| Technical specifications | Conform  Yes No | | Comments |
| 1. **FUEL FILTER/WATER SEPARATOR:**   A Racor fuel/water separator shall be installed in place of the Cummins fuel/water separator with drain. The unit shall utilize a three-step separate process: centrifuge for primary contaminant separation, conical baffles for water coalescing, and a replaceable filter for final particulate removal. The separator shall have a bottom drain for removing contaminants, shall be heated and shall have a rated maximum flow of 3.16 GPM. A sensor with indicator light and audible alarm shall be provided for the Racor fuel/water separator. The indicator light shall be mounted in the cab visible to the driver with the unit located inside the frame rails. The unit will alert the driver of high water content in the separator bowl. |  |  |  |
| **Fuel Shut-Off**  A shut-off valve shall be supplied to prevent drain back of fuel into the main supply line during filter changes. The valve(s) shall be located: one (1) inlet side of fuel/water separator. |  |  |  |
| Technical specifications | Conform  Yes No | | Comments |
| 1. **FUEL SYSTEM:**   One (1) 65-gallon fuel tank shall be provided. The tank shall be of an all-welded, aluminized-steel construction with anti-surge baffles and shall conform to all applicable Administration (FHWA) 393.65 and 393.67 standards. The tank shall be mounted below the frame rails at the rear of the chassis for maximum protection. The tank shall be secured with two (2) wrap-around T-bolt type stainless steel straps. Each strap shall be fitted with protective rubber insulation and shall be secured with Grade 8 hardware. This design allows for tank removal from below the chassis. |  |  |  |
| The fuel tank shall be equipped with a 2” diameter filler neck. The filler neck shall extend to the rear of the vehicle behind the rear tires and away from the heat of the exhaust system as required by **NFPA 1901** Standard for Automotive Fire Apparatus. The open end of the filler neck shall be equipped with a twist-off filler cap with a retaining chain. |  |  |  |
| The tank shall be plumbed with top-draw and top-return fuel lines in order to protect the lines from road debris. Bottom-draw and/or bottom-return fuel lines are not acceptable. A vent shall be provided at the top of the tank. The vent shall be connected to the filler neck to prevent splash-back during fueling operations. A .50” NPT drain plug shall be provided at the bottom of the tank. |  |  |  |
| An auxiliary 12-volt fuel pump shall be included in the fuel system. The electric pump shall permit re-priming of the fuel lines and engine. The pump may be manually operated with a switch located accessible to driver. The electric pump shall also automatically operate in conjunction with the mechanical fuel pump as long as engine oil pressure is present. The system shall be plumbed to allow full flow to by-pass the pump. |  |  |  |
| All fuel lines shall be rubber. |  |  |  |
| Technical specifications | Conform  Yes No | | Comments |
| 1. **FUEL SHUTOFF VALVE:**   Two (2) fuel shutoff valves shall be installed at the fuel filter to allow the fuel filter to be changed without loss of fuel to the fuel pump. |  |  |  |
| Technical specifications | Conform  Yes No | | Comments |
| 1. **FUEL COOLER:**   The cross-flow air to fuel cooler shall be all aluminum and shall be provided to lower fuel temperature allowing the vehicle to operate at higher ambient temperatures. The fuel cooler shall be located behind the battery box, under the frame. |  |  |  |
| The fuel cooler shall be mounted to radiator. |  |  |  |
| Technical specifications | Conform  Yes No | | Comments |
| 1. **ALTERNATOR:**   **360 Amp Alternator**  A Niehoff model C505 360-amp SAE (J56) rated, 320 amps at 200 degrees F NFPA 1901 rated brush-less type alternator with rectifier shall be provided. It shall be self-energized and shall have a negative voltage compensating remote solid-state voltage regulator. The alternator shall be installed in accordance with the engine manufacturer`s recommendations. |  |  |  |
| Technical specifications | Conform  Yes No | | Comments |
| 1. **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 prognostic diagnostic capabilities. These capabilities shall include the monitoring of the fluid life, filter change indication, and transmission clutch maintenance. |  |  |  |
| The transmission shall include an original equipment manufacturer installed magnetic oil drain plug. |  |  |  |
| The transmission shall be provided with an automatic neutral. When the parking brake is applied the transmission automatically returns to neutral. |  |  |  |
| The transmission shall include two (2) internal oil filters and Allison approved synthetic 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 gear ratios shall be as follows:  **1 - 3.49**  **2 - 1.86**  **3 - 1.41**  **4 - 1.00**  **5 - .75**  **R - 5.03** |  |  |  |
| The transmission shall be programmed to comply with **NFPA 1901** and automatically shift to neutral upon application of the parking brake |  |  |  |
| Technical specifications | Conform  Yes No | | Comments |
| 1. **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 |  |  |  |
| Technical specifications | Conform  Yes No | | Comments |
| 1. **TRANSMISSION SHIFT SELECTOR:**   An **Allison GEN V** pressure sensitive range selector touch pad shall be provided and located on the tunnel to the right of the driver.  The shift selector shall provide an indicator on the digital display and shall alert the driver/operator when a specific maintenance function is required. |  |  |  |
| The transmission driven power take off (PTO) shall be mounted in the 1:00 o’clock position. |  |  |  |
| Technical specifications | Conform  Yes No | | Comments |
| 1. **TRANSMISSION MODE PROGRAMMING:**   The transmission, upon start-up, will select the fifth speed operation without the need to press the mode button. |  |  |  |
| The EVS group package number 127 shall contain the 198-vocational package for the fire service for 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 which requires re-selecting the 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. The transmission will detect the pump engaged signal and automatically select or deselect fourth gear lock-up. 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 nine (9) pin diagnostic connector will be provided next to the steering column. |  |  |  |
| Technical specifications | Conform  Yes No | | Comments |
| 1. **DRIVELINE:**   All drivelines shall be heavy duty metal tube and equipped with Spicer 1710HD 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®. |  |  |  |
| Technical specifications | Conform  Yes No | | Comments |
| 1. **ELECTRICAL SYSTEM:**   The cab and chassis system shall have a centrally located electrical distribution area. All electrical components shall be located such that standard operations shall not interfere with or disrupt vehicle operation. An automatic thermal-reset master circuit breaker compatible with the alternator size shall be provided. Automatic-reset circuit breakers shall be used for directional lights, cab heater, battery power, ignition, and other circuits. An access cover shall be provided for maintenance access to the electrical distribution area. |  |  |  |
| A 6 place, constantly hot, and 6 place ignition switched fuse panel and ground for customer-installed radios and chargers shall be provided at the electrical distribution area. Radio suppression shall be sufficient to allow radio equipment operation without interference. |  |  |  |
| All wiring shall be mounted in the chassis frame and protected from impact, abrasion, water, ice, and heat sources. The wiring shall be color-coded and functionally-labeled every 3” on the outer surface of the insulation for ease of identification and maintenance. The wiring harness shall conform to SAE 1127 with GXL temperature properties. Any wiring connections exposed to the outside environment shall be weather-resistant. All harnesses shall be covered in a loom that is rated at 280 degrees F to protect the wiring against heat and abrasion. |  |  |  |
| A Vehicle Data Computer (VDC) shall be supplied within the electrical system to process and distribute engine and transmission  Electronic Control Module (ECM) information to chassis system gauges, the message center, and related pump panel gauges. Communication between the VDC and chassis system gauges shall be through a 4-wire multiplexed communication system to ensure accurate engine and transmission data is provided at the cab dash and pump. The VDC shall be protected against corrosion, excessive heat, vibration, and physical damage. |  |  |  |
| Technical specifications | Conform  Yes No | | Comments |
| 1. **EMI/RFI PROTECTION:**   To prevent erroneous signals from crosstalk contamination and interference, the electrical system will meet, at a minimum, **SAE J551/2,** thus reducing undesired electromagnetic and radio frequency emissions. An advanced electrical system will be used to ensure radiated and conducted electromagnetic interference (EMI) or radio frequency interference (RFI) emissions are suppressed at their source. |  |  |  |
| The apparatus will have the ability to operate in the electromagnetic environment typically found in fire ground operations to ensure clean operations. The electrical system will meet, without exceptions, electromagnetic susceptibility conforming to **SAE J1113/25** Region 1, **Class C EMR for 10KHz-1GHz** to 100 Volts/Meter. The vehicle OEM, upon request, will provide EMC testing reports from testing conducted on an entire apparatus and will certify that the vehicle meets SAE J551/2 and **SAE J1113/25 Region 1, Class C EMR for 10KHz-1GHz to 100** Volts/Meter requirements. Component and partial (incomplete) vehicle testing is not adequate as overall vehicle design can impact test results and thus is not acceptable by itself. |  |  |  |
| EMI/RFI susceptibility will be controlled by applying appropriate circuit designs and shielding. The electrical system will be designed for full compatibility with low-level control signals and high-powered two-way radio communication systems. Harness and cable routing will be given careful attention to minimize the potential for conducting and radiated EMI/RFI susceptibility |  |  |  |
| Technical specifications | Conform  Yes No | | Comments |
| 1. **ELECTRICAL HARNESSING INSTALLATION:**   To ensure rugged dependability, all wiring harnesses installed by the apparatus manufacturer will conform to the following specifications:  **SAE J1128** - Low tension primary cable  **SAE J1292** - Automobile, truck, truck-tractor, trailer and motor coach wiring  **SAE J163** - Low tension wiring and cable terminals and splice clips  **SAE J2202** - Heavy duty wiring systems for on-highway trucks  **NFPA 1901** - Standard for automotive fire apparatus  **FMVSS 302** - Flammability of interior materials for passenger cars, multipurpose passenger vehicles, trucks and buses  **SAE J1939** - Serial communications protocol  **SAE J2030** - Heavy-duty electrical connector performance standard  **SAE J2223** - Connections for on board vehicle electrical wiring harnesses NEC - National Electrical Code  **SAE J561** - Electrical terminals - Eyelet and spade type  **SAE J928** - Electrical terminals - Pin and receptacle type A |  |  |  |
| For increased reliability and harness integrity, harnesses will be routed throughout the cab and chassis in a manner which allows the harnessing to be laid into its mounting location. Routing of harnessing which requires pulling of wires through tubes will not be allowed.  Wiring will be run in loom or conduit where exposed, and have grommets or other edge protection where wires pass through metal. Wiring will be color, function and number coded. Wire colors will be integral to each wire insulator and run the entire length of each wire. Harnessing containing multiple wires and uses a single wire color for all wires will not be allowed. Function and number codes will be continuously imprinted on all wiring harness conductors at 3.00" intervals. All wiring installed between the cab and into doors will be protected by an expandable rubber boot to protect the wiring. Exterior exposed wire connectors will be positive locking, and environmentally sealed to withstand elements such as temperature extremes, moisture and automotive fluids. |  |  |  |
| Electrical wiring and equipment will be installed utilizing the following guidelines:   * All wire ends not placed into connectors will be sealed with a heat shrink end cap. Wires without a terminating connector or sealed end cap will not be allowed. |  |  |  |
| * All holes made in the roof will be caulked with silicon. Large fender washers, liberally caulked, will be used when fastening equipment to the underside of the cab roof. |  |  |  |
| * Any electrical component that is installed in an exposed area will be mounted in a manner that will not allow moisture to accumulate in it. Exposed area will be defined as any location outside of the cab or body. |  |  |  |
| * For low cost of ownership, electrical components designed to be removed for maintenance will be quickly accessible. For ease of use, a coil of wire will be provided behind the appliance to allow them to be pulled away from the mounting area for inspection and service work. |  |  |  |
| * Corrosion preventative compound will be applied to non-waterproof electrical connectors located outside of the cab or body. All non-waterproof connections will require this compound in the plug to prevent corrosion and for easy separation of the plug. |  |  |  |
| * Any lights containing non-waterproof sockets in a weather-exposed area will have corrosion preventative compound added to the socket terminal area. |  |  |  |
| * All electrical terminals in exposed areas will have protective Coating applied completely over the metal portion of the terminal. |  |  |  |
| * Rubber coated metal clamps will be used to support wire harnessing and battery cables routed along the chassis frame rails. |  |  |  |
| * Heat shields will be used to protect harnessing in areas where high temperatures exist. Harnessing passing near the engine exhaust will be protected by a heat shield. |  |  |  |
| * Cab and crew cab harnessing will not be routed through enclosed metal tubing. Dedicated wire routing channels will be used to protect harnessing therefore improving the overall integrity of the vehicle electrical system. The design of the cab will allow for easy routing of additional wiring and easy access to existing wiring. |  |  |  |
| * All braided wire harnesses will have a permanent label attached for easy identification of the harness part number and fabrication date. |  |  |  |
| * All standard wiring entering or exiting the cab will be routed through sealed bulkhead connectors to protect against water intrusion into the cab. |  |  |  |
| Technical specifications | Conform  Yes No | | Comments |
| 1. **BATTERY CABLE INSTALLATION:**   The manufacturer shall supply four (4) heavy duty Group 31 12-volt maintenance-free batteries. Each battery shall be installed and positioned so as to allow easy replacement of any single battery. Each battery shall be equipped with carrying handles to facilitate ease of removal and replacement. There shall be two (2) steel frame mounted battery boxes, one (1) on the left frame rail and one (1) on the right frame rail. Each battery box shall be secured to the frame rail with Grade 8 hardware. Each battery box shall hold (2) batteries. The batteries shall have a minimum combined rating of 4,000 (4 x 1000) cold cranking amps (CCA) @ 0 degrees Fahrenheit and 820 (4 x 205) minutes of reserve capacity for extended operation. The batteries shall have 3/8-16 threaded stud terminals to ensure tight cable connections. The battery stud terminals shall each be treated with concentrated industrial soft-seal after cable installation to promote corrosion prevention. The positive and negative battery stud terminals and the respective cables shall be clearly marked to ensure quick and mistake-proof identification. |  |  |  |
| Batteries shall be placed on non-corrosive rubber matting and secured with hold-down brackets to prevent movement, vibration, and road shock. The hold-down bracket J-hooks shall be cut to fit and shall have all sharp edges removed. The batteries shall be placed in plastic trays to provide preliminary containment should there be leakage of hazardous battery fluids. There shall be two (2) plastic trays, each containing (2) batteries. Each battery tray shall be equipped with a rubber vent hose to facilitate drainage. The rubber vent hose shall be routed to drain beneath the battery box. The batteries shall be positioned in well-ventilated areas.  One (1) positive and one (1) negative jumper stud shall be provided. |  |  |  |
| Batteries shall have a warranty of twelve (12) months that shall commence upon the date of delivery of the apparatus. |  |  |  |
| **Battery Splash Cover**  The batteries shall be supplied with a ULC compliant cover system. Fabricated aluminum plates with an acid resistant coating shall be supplied and installed. |  |  |  |
| Technical specifications | Conform  Yes No | | Comments |
| 1. **ELECTRICAL COMPONENT INSTALLATION:**   All lighting used on the apparatus will be, at a minimum, a two (2) wire light grounded through a wired connection to the battery system. Lights using an apparatus metal structure for grounding will not be allowed.  An operational test will be conducted to ensure that any equipment that is permanently attached to the electrical system is properly connected and in working order. The results of the tests will be recorded and provided to the purchaser at time of delivery. |  |  |  |
| Technical specifications | Conform  Yes No | | Comments |
| 1. **12V POWER POINTS:**   There shall be one (1) 12v power point and one (1) dual USB power point provided. They shall be mounted in the driver’s side of the dash. They shall be within easy reach of the driver; and shall be wired directly to the battery |  |  |  |
| Technical specifications | Conform  Yes No | | Comments |
| 1. **DRIVER SWITCH PANEL:**   The driver panel to the right of the Driver’s position shall include the following: |  |  |  |
| * In the upper most row it shall have the HVAC Controls, which shall include three (3) controls, the fan speed, comfort and defrost control, and temperature control. In the far-right position shall be the seat belt indicator. |  |  |  |
| * In the middle section, there shall be eight (8) backlit switches, the switch on the far-right side shall be a high idle switch. |  |  |  |
| * In the bottom row, there shall be six (6) switches. The two (2) switches in the far-right location shall be the dimmer switch in the second to last switch location and the wiper controls in the last switch location. |  |  |  |
| Technical specifications | Conform  Yes No | | Comments |
| 1. **MASTER WARNING SWITCH:**   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. |  |  |  |
| Technical specifications | Conform  Yes No | | Comments |
| 1. **ACCESSORY POWER DISTRIBUTION PANEL:**   An accessory power distribution panel shall be installed behind the officer's seat. The panel shall feature ten (10) blade type fuses protected by a 40-amp fuse. The panel shall be capable of carrying up to a maximum 40-amp battery direct load. |  |  |  |
| Technical specifications | Conform  Yes No | | Comments |
| 1. **COMMUNICATION ANTENNA BASE:**   A communications antenna base shall be provided and mounted on the cab roof on the Officer's side. |  |  |  |
| The cable routing for the communication antenna shall terminate under the dash panel. |  |  |  |
| Technical specifications | Conform  Yes No | | Comments |
| 1. **VEHICLE DATA RECORDER:**   Apparatus shall be equipped with a Class1 “Vehicle Data Recorder (VDR) that is connected to the power train CAN (Controller Area Network) bus consisting of transmission (TCM), engine control (ECM) and anti-lock brake (ABS) modules mounted on the apparatus. The VDR will function per NFPA 1901-2009 sections 4.11 (Vehicle Data Recorder) utilizing the power train s J1939 data. |  |  |  |
| The VDR data shall be downloadable by USB cable to a computer using either Microsoft ™ or Apple ™ Operating Systems using Class 1/ O.E.M. supplied reporting software. The latest version of the software shall be available by contacting Class 1. |  |  |  |
| The apparatus shall be equipped with a Class1 Seat Belt Warning System” (SBW) that is connected to the power train CAN (Controller Area Network) bus consisting of transmission (TCM), engine control (ECM) and anti-lock brake (ABS) modules mounted on the apparatus. The SBW will function **per NFPA 1901-2009 14.1.3.10 (Seat Belt Warning)** using the Class1 “Seat Belt Input Module” for seat occupied and belt status information. |  |  |  |
| The SBW system shall have the ability to use either normally open (NO) or normally closed (NC) switches (user selectable by “dip switches” at ground potential) for operation. |  |  |  |
| Technical specifications | Conform  Yes No | | Comments |
| 1. **DIAGNOSTIC PANEL:**   A diagnostic panel shall allow diagnostic tools such as computers to connect to various vehicle systems for improved trouble shooting providing a lower cost of ownership. The panel shall be accessible while standing on the ground and located inside the driver's door to the left of the steering column. Diagnostic switches shall allow engine and ABS systems to provide blink codes should a problem exist. |  |  |  |
| The diagnostic panel shall include:   * Engine diagnostic port |  |  |  |
| * Engine diagnostic switch (blink codes flashed on check engine telltale indicator) |  |  |  |
| * Diesel particulate filter regeneration switch (when applicable) |  |  |  |
| * Diesel particulate filter regeneration inhibit switch (when applicable) |  |  |  |
| The enclosed diagnostic panel, accessible  through the HVAC access panel shall include:   * Transmission diagnostic port |  |  |  |
| * ABS diagnostic port |  |  |  |
| Technical specifications | Conform  Yes No | | Comments |
| 1. **BACKLIGHTING COLOR:**   The instrumentation gauges and the switch panel legends shall be backlit using red LED backlighting. |  |  |  |
| Technical specifications | Conform  Yes No | | Comments |
| 1. **BATTERIES:**   The single start electrical system shall include four (4) 1070 CCA batteries. |  |  |  |
| The batteries shall feature:   * A 210-minute reserve capacity |  |  |  |
| * 4/0 dual path starter cables per SAE J54 |  |  |  |
| * Heat shrink and sealant encapsulated ends on the cables |  |  |  |
| * Maintenance free |  |  |  |
| Technical specifications | Conform  Yes No | | Comments |
| 1. **BATTERY COMPARTMENTS:**   A well-ventilated battery storage compartment shall house the batteries on the officer and driver side of the chassis and shall be located so as to offer easy access to the batteries when the cab is tilted. |  |  |  |
| Each battery compartment shall feature a hot dipped galvanized battery box and cover |  |  |  |
| Technical specifications | Conform  Yes No | | Comments |
| 1. **BATTERY CABLES:**   The starting system shall include cables which shall be protected by a 275-degree F, minimum high temperature flame retardant loom. |  |  |  |
| The cables shall be in a loom to help keep out dirt, dust and debris. |  |  |  |
| Technical specifications | Conform  Yes No | | Comments |
| 1. **BATTERY JUMPER STUD:**   The starting system shall include battery jumper studs. |  |  |  |
| These studs shall be located in the forward most portion of the driver's side lower step. |  |  |  |
| The studs shall allow the vehicle to be jump started, charged, or the cab to be raised in an emergency in the event of battery failure. |  |  |  |
| Technical specifications | Conform  Yes No | | Comments |
| 1. **IGNITION:**   A master battery system with a keyless start ignition system shall be provided.  Each system shall be controlled by a marine grade two position switch, of which shall be mounted on the left side of the steering wheel adjacent to the driver's knee. |  |  |  |
| A push button type starter button shall be provided on the driver dash to the left of the steering wheel. |  |  |  |
| The starter button shall only operate when both the master battery and ignition switches are in the “ON” position. |  |  |  |
| Technical specifications | Conform  Yes No | | Comments |
| 1. **POWER & GROUND STUD:**   An electrical distribution panel shall include two (2) power studs. The studs shall be a minimum of 1/4" 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) 1/4" ground stud. |  |  |  |
| Technical specifications | Conform  Yes No | | Comments |
| 1. **GROUND LIGHTS:**   Each door shall include a round Truck lite LED ground light mounted to the underside of the cab step below each door. |  |  |  |
| Each light shall include a polycarbonate lens, a housing which is vibration welded and a bulb which shall be shock mounted for extended life. |  |  |  |
| The ground lights shall activate when the park brake is engaged. |  |  |  |
| Technical specifications | Conform  Yes No | | Comments |
| 1. **CAB STEP LIGHTING:**   One (1) LED light shall be mounted to the riser of the middle cab step, a total of eight (8) step lights for the cab, in accordance with NFPA. |  |  |  |
| **The lights shall be round and the brand shall be Truck lite** |  |  |  |
| Technical specifications | Conform  Yes No | | Comments |
| 1. **ENGINE COMPARTMENT LIGHTING:**   Two (2) LED lights shall be mounted to the engine compartment in such a fashion as to provide as much light as possible to the engine compartment area. The engine compartment lighting shall activate with the tilting of the cab.  The lights shall be **FRC sunstrip LED200-A18** |  |  |  |
| Technical specifications | Conform  Yes No | | Comments |
| 1. **INTERIOR OVERHEAD CAB LIGHTING:**   Each cab door shall include a dual blue and white LED lamp. There shall be one (1) light centered over each of the Driver and Officer’s seat and one centered over each crew door. |  |  |  |
| The clear lamp shall illuminate with the opening of each respective door with both the blue and clear portions of the lamp activated by individual lighted switches on each lamp. |  |  |  |
| Technical specifications | Conform  Yes No | | Comments |
| 1. **DO NOT MOVE APPARATUS LIGHT:**   The front headliner of the cab shall include a flashing red round LED light with a red lens clearly labeled "Do Not Move Apparatus".  The flashing red light shall be 3.00 inches in diameter and shall be located centered left to right for greatest visibility. |  |  |  |
| The light 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. |  |  |  |
| Technical specifications | Conform  Yes No | | Comments |
| 1. **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. |  |  |  |
| Technical specifications | Conform  Yes No | | Comments |
| 1. **BATTERY CHARGER AND AIR COMPRESSOR:**   The battery charger receptacle shall be a **Kussmaul 20 amp NEMA 5-20** Super Auto-**Eject #091-55-20-120** with a cover. The Super Auto-Eject receptacle shall be completely sealed and have an automatic power line disconnect. |  |  |  |
| A **Kussmaul model 091-9B-1, 120V** air compressor shall be installed. |  |  |  |
| The air compressor shall be powered by a 120-volt inlet receptacle and has an output of .76 cfm at 100 psi. A pressure switch senses the system pressure and operates the compressor whenever the pressure in the air brake system drops below a pre-determined level. |  |  |  |
| A **Kussmaul model 091-9-089 120V** auto drain shall be provided for a Kussmaul 120V air compressor model 091-9B-1. |  |  |  |
| The receptacle shall be located outside driver's door next to handrail and the cover color shall be Red. |  |  |  |
| Technical specifications | Conform  Yes No | | Comments |
| 1. **LOW VOLTAGE ELECTRICAL SYSTEM SPECIFICATIONS:**   The electrical system shall include all panels, electrical components, switches and relays, wiring harnesses and other electrical components. The electrical equipment installed by the apparatus manufacturer shall conform to current automotive electrical system standards, the latest Federal DOT standards, and the requirements of the applicable NFPA standards. |  |  |  |
| All wiring shall be stranded copper or copper alloy conductors of a gauge rated to carry 125 percent of the maximum current for the protected circuit. Voltage drops in all wiring from the power source to the using device shall not exceed 10 percent. The wiring and wiring harness and insulation shall be in conformance to applicable SAE and NFPA standards. The wiring harness shall conform to SAE J-1128 with GXL temperature properties. All exposed wiring shall be protected in a loom with a minimum 289-degree Fahrenheit rating. All wiring looms shall be properly supported and attached to body members. The electrical conductors shall be constructed in accordance with applicable SAE standards, except when good engineering practice requires special construction. |  |  |  |
| The wiring connections and terminations shall use a method that provides a positive mechanical and electrical connection and shall be installed in accordance with the device manufacturer's instructions. Electrical connections shall be with mechanical type fasteners and large rubber grommets where wiring passes through metal panels. |  |  |  |
| The wiring between the cab and body shall be joined using Deutsche type connectors or an enclosed in a terminal junction panel area. This system will permit body removal with minimal impact on the apparatus electrical system.  All connections shall be crimp-type with insulated shanks to resist moisture and foreign debris such as grease and road grime. Weather-resistant connectors shall be provided throughout to ensure the integrity of the electrical system. |  |  |  |
| There shall be no exposed electrical cabling, harnesses, or terminal connections located in compartments, unless they are enclosed in a junction box or covered with a removable electrical panel. The wiring shall be secured in place and protected against heat, liquid contaminants and damage. Wiring shall be uniquely identified every three-inches (3") by color coding or permanent marking with a circuit function code and identified on a reference chart or electrical wiring schematic per requirements of applicable NFPA #1901 standards. |  |  |  |
| The electrical circuits shall be provided with low voltage overcurrent protective devices. Such devices shall be accessible and located in required terminal connection locations or weather resistant enclosures. The overcurrent protection shall be suitable for electrical equipment and shall be automatic reset type and meet SAE standards. All electrical equipment, switches, relays, terminals, and connectors shall have a direct current rating of 125 percent of maximum current for which the circuit is protected. The system shall have electro-magnetic interference suppression provided as required in applicable SAE standards. |  |  |  |
| The electrical system shall include the following:   * Electrical terminals in weather exposed areas shall have a non-conductive grease or spray applied. A corrosion preventative compound shall be applicable to all terminal plugs located outside of the cab or body. |  |  |  |
| * The electrical wiring shall be harnessed or be placed in a protective loom. |  |  |  |
| * Holes made in the roof shall be caulked with silicone. Large fender washers shall be used when fastening equipment to the underside of the cab roof. |  |  |  |
| * Any electrical component that is installed in an exposed area shall be mounted in a manner that will not allow moisture to accumulate in it. |  |  |  |
| * A coil of wire must be provided behind an electrical appliance to allow them to be pulled away from mounting area for inspection and service work. |  |  |  |
| * All lights that have their sockets in a weather exposed area shall have corrosion preventative compound added to the socket terminal area. |  |  |  |
| The warning lights shall be switched in the chassis cab with labeled switches in an accessible location. Individual rocker switches shall be provided only for warning lights provided over the minimum level of warning lights in either the stationary or moving modes. All electrical equipment switches shall be mounted on a switch panel mounted in the cab convenient to the operator. The warning light switches shall be of the rocker type. For easy nighttime operation, an integral indicator light shall be provided to indicate when the circuit is energized. All switches shall be appropriately identified as to their function. |  |  |  |
| A single warning light switch shall activate all required warning lights. This switch will allow the vehicle to respond to an emergency and "call for the right of way". When the parking brake is applied, a "blocking right of way" system shall automatically activate per requirements of the applicable NFPA standards. All "clear" warning lights shall be automatically turned off upon application of the parking brake. |  |  |  |
| Technical specifications | Conform  Yes No | | Comments |
| 1. **NFPA REQUIRED TESTING OF ELECTRICAL SYSTEM:**   The apparatus shall be electrically tested upon completion of the vehicle and prior to delivery. The electrical testing, certifications, and test results shall be submitted with delivery documentation per requirements of the applicable NFPA standards. The following minimum testing shall be completed by the apparatus manufacturer:  **1. Reserve capacity test:**  The engine shall be started and kept running until the engine and engine compartment temperatures are stabilized at normal operating temperatures and the battery system is fully charged. The engine shall be shut off and the minimum continuous electrical load shall be activated for ten (10) minutes. All electrical loads shall be turned off prior to attempting to restart the engine. The battery system shall then be capable of restarting the engine. Failure to restart the engine shall be considered a failed test. |  |  |  |
| **2. Alternator performance test at idle:**  The minimum continuous electrical load shall be activated with the engine running at idle speed. The engine temperature shall be stabilized at normal operating temperature. The battery system shall be tested to detect the presence of battery discharge current. The detection of battery discharge current shall be considered a test failure. |  |  |  |
| **3. Alternator performance test at full load**:  The total continuous electrical load shall be activated with the engine running up to the engine manufacturer's governed speed. The test duration shall be a minimum of two (2) hours. Activation of the load management system is permitted during this test. However, if an alarm sounds due to excessive battery discharge, as detected by the system requirements in the NFPA standards, or a system voltage of less than 11.7 volts’ dc for more than 120 seconds is present, the test has failed. |  |  |  |
| **4. Low voltage alarm test:**  Following the completion of the above tests, the engine shall be shut off. The total continuous electrical load shall be activated and shall continue to be applied until the excessive battery discharge alarm activates. The battery voltage shall be measured at the battery terminals. With the load still applied, a reading of less than 11.7 volts’ dc for a 12-volt system shall be considered a test failure. The battery system shall then be able to restart the engine. Failure to restart the engine shall be considered a test failure. |  |  |  |
| **NFPA REQUIRED DOCUMENTATION**  The following documentation shall be provided on delivery of the apparatus:   * Documentation of the electrical system performance tests required above. |  |  |  |
| A written load analysis, including:   * The nameplate rating of the alternator. |  |  |  |
| * The alternator rating under the conditions. |  |  |  |
| * Each specified component load. |  |  |  |
| * Individual intermittent loads. |  |  |  |
| Technical specifications | Conform  Yes No | | Comments |
| 1. **WEATHER RESISTANT ELECTRICAL JUNCTION BOX:**   The electrical junction or terminal boxes shall be weather resistant and located away from water spray conditions. In addition, the main body junction panel shall house the automatic reset breakers and relays where required. The main body junction panel shall be located in the pump compartment. |  |  |  |
| Technical specifications | Conform  Yes No | | Comments |
| 1. **LOAD MANAGER:**   The apparatus shall be equipped with a Kussmaul model 091-79 Automatic Load Shedding System for performing continuous electrical load management. |  |  |  |
| The Load Manager shall have the following features:   * Monitor 12-volt system and detect low voltage. |  |  |  |
| * Capability to control two (2) loads. |  |  |  |
| * Automatic reset when voltage rises. |  |  |  |
| * Adjustable voltage set point. |  |  |  |
| The load manager shall be protected against reverse polarity and shorted outputs, and be enclosed in an enclosure to enhance EMI/RFI protection. The manufacturer shall provide for all electrical loads in excess of the NFPA minimum electrical requirements that exceed the alternator output. |  |  |  |
| Technical specifications | Conform  Yes No | | Comments |
| 1. **MULTIPLEX SYSTEM:**   For superior system integrity, the networked multiplex system shall meet the following minimum component requirements: |  |  |  |
| * The network system must be Peer to Peer technology based on RS485 protocol. No one module shall hold the programming for other modules. One or two modules on a network referred to as Peer to Peer, while the rest of the network consists of a one master and several slaves is not considered Peer to Peer for this application. |  |  |  |
| * Modules shall be IP67 rated to handle the extreme operating environment found in the fire service industry. |  |  |  |
| * All modules shall be solid state circuitry utilizing MOS-FET technology and utilize Deutsch series input/output connectors. |  |  |  |
| * Each module that controls a device shall hold its own configuration program. |  |  |  |
| * Each module should be able to function as a standalone module. No “add- on” module will be acceptable to achieve this form of operation. |  |  |  |
| * Load shedding power management (8 levels). |  |  |  |
| * Switch input capability for chassis functions. |  |  |  |
| * Responsible for lighting device activation. |  |  |  |
| * Self-contained diagnostic indicators. |  |  |  |
| * Wire harness needed to interface electrical devices with multiplex modules. |  |  |  |
| * The grounds from each device should return to main ground trunk in each sub harness by the use of ultrasonic splices. |  |  |  |
| **Wiring**  All harnessing, wiring and connectors shall be manufactured to the following standards/guidelines**. No exceptions.** |  |  |  |
| * NFPA 1901-Standard for Automotive Fire Apparatus |  |  |  |
| * SAE J1127 and J1127 |  |  |  |
| * IPC/WHMA-A-620 – Requirements and Acceptance for Cable and Wire Harness Assemblies. (Class 3 – High Performance Electronic Products) |  |  |  |
| All wiring shall be copper or copper alloys of a gauge rated to carry 125 of the maximum current for which the circuit is protected. Insulated wire and cable 8ga and smaller shall be SXL, GXL, or TXL per SAE J1128. Conductors 6ga and larger shall be SXL or SGT per SAE J1127. |  |  |  |
| All wiring shall be colored coded and imprinted with the circuit’s function. Minimum height of imprinted characters shall not be less than .082” plus or minus .01”. The imprinted characters shall repeat at a distance not greater than 3”.  A coil of wire shall be provided behind electrical appliances to allow them to be pulled away from mounting area for inspection and service work. |  |  |  |
| **Wiring Protection**  The overall covering of the conductors shall be loom or braid |  |  |  |
| Braid style wiring covers shall be constructed using a woven PVC-coated nylon multifilament braiding yarn. The yarn shall have a diameter of no less than .04” and a tensile strength of 22lbs. The yarn shall have a service temperature rating of -65 F to 194 F. The braid shall consist of 24 strands of yarn with 21 black and 3 yellow. The yellow shall be oriented the same and be next to each other. |  |  |  |
| Wiring loom shall be flame retardant black nylon. The loom shall have a service temperature of -40 F to 300 F and be secured to the wire bundle with adhesive-backed vinyl tape. |  |  |  |
| **Wiring Connectors**  All connectors shall be Deutsch series unless a different series of connector is needed to mate to a supplier’s component. The connectors and terminals shall be assembled per the connector/terminal manufacturer’s specification. Crimble/Solderless terminals shall be acceptable. Heat shrink style shall be utilized unless used within the confines of the cab. |  |  |  |
| The apparatus shall be electrical tested upon completion of the vehicle and prior to delivery. |  |  |  |
| 1. **Multiplex display:**   The V-MUX multiplex electrical system shall include Two Vista IV color displays.  The displays shall have the following features:   * Aspect ratio of 16:9 (Wide Screen) * Diagonal measurement of no less than 7” * Master warning switch * Engine high idle switch * Five (5) tactile switches to access secondary menus * Eight (8) multi-function programmable tactile switches * Specific door ajar indication * Real time clock * Provides access to the multiplex system diagnostics * Video capability for optional back-up camera(s) and GPS display   The displays shall be located officer's side engine cover, driver's side engine cover. |  |  |  |
| Technical specifications | Conform  Yes No | | Comments |
| 1. **VEHICLE DATA RECORDER:**   A vehicle data recorder system shall be provided to comply with the 2009 and 2016 editions of **NFPA 1901**. The following data shall be monitored:   * Vehicle speed MPH * Acceleration (from speedometer) MPH/Sec. * Deceleration (from speedometer) MPH/Sec. * Engine speed RPM * Engine throttle position % of full throttle * ABS Event On/Off * Seat occupied status Occupied Yes/No by position * Seat belt status Buckled Yes/No by position * Master Optical Warning Device Switch On/Off * Time: 24-hour time * Date: Year/Month/Day   There shall be a visual and audible warning system installed in the cab that indicates the occupant buckle status of all cab seating positions that are designed to be occupied during vehicle movement.  The audible warning shall activate when the vehicle’s park brake is released and a seat position is not in a valid state. A valid state is defined as a seat that is unoccupied and the seat belt is unbuckled, or one that has the seat belt buckled after the seat has been occupied.  The visual warning shall consist of a graphical display that will continuously indicate the validity of each seat position.  The system shall include a display panel with LED back-lit ISO indicators for each seating position, seat sensor and safety belt latch switch for each cab seating position, audible alarm and braided wiring harness.  The display panel shall be located Driver side of center dash electrical cover. |  |  |  |
| Technical specifications | Conform  Yes No | | Comments |
| 1. **AIR HORNS:**   Two (2) 24.5" Stuttertone or Hedley air horns shall be recess mounted into the front bumper with one positioned on each side. They shall be flat black.  An air protection valve shall be provided in the air horn piping that will not allow the chassis air brake system to drop below 90 PSI. |  |  |  |
| Technical specifications | Conform  Yes No | | Comments |
| 1. **ELECTRIC TRAFFIC HORN AND AIR HORN SELECTOR SWITCH:**   One (1) selector switch shall be provided on the cab's dash that will allow the chassis steering wheel horn button to activate either the electric traffic horn or air horn system. |  |  |  |
| Technical specifications | Conform  Yes No | | Comments |
| 1. **AIR HORN ACTIVATION:**   The air horn activation switches shall be overhead. |  |  |  |
| Two ropes shall be installed, one on the driver side and one on the passenger side. |  |  |  |
| Technical specifications | Conform  Yes No | | Comments |
| 1. **PUMP ENCLOSURE LIGHTS:**   One (1) LED work light shall be provided in the pump enclosure. |  |  |  |
| The control switch shall be mounted on the light head. |  |  |  |
| The light shall be FRC Sunstrip LED200-A18 |  |  |  |
| Technical specifications | Conform  Yes No | | Comments |
| 1. **BACKUP CAMERA SYSTEM:**   high resolution rear camera for improved picture quality and safety surrounding the apparatus. A cast aluminum sealed rear camera enclosure shall be included with the basic package, along with military type electronic connections. |  |  |  |
| The monitor shall be a CAMLCD-70 7" and include a cable connection assembly. The system shall be capable of monitoring up to four video inputs. When the apparatus is powered up, the monitor will automatically detect and display up to four camera images on the screen as a prove out that all are working. Pressing the power button will put the system into stand by mode. When a trigger signal is detected, reverse, signal lights, etc., that camera will become live, and the monitor will awake to display that image. |  |  |  |
| When the trigger signal disappears, the monitor will return to standby mode. Manual pressing the power button a second time will awake the monitor to display all connected cameras again. The rear camera system includes one way audio to the monitor from the rear of the apparatus. |  |  |  |
| Technical specifications | Conform  Yes No | | Comments |
| 1. **MARKER LIGHTS:**   One (1) pair of Britax model L427.203L.12V LED amber/red marker rubber housed lights shall be provided. |  |  |  |
| The lights shall be located on the rear body corners mounted in the down angle position. The red lenses shall illuminate to the rear of the apparatus and the amber shall illuminate to the front of the apparatus. The lights shall be wired to the marker light circuit. |  |  |  |
| Technical specifications | Conform  Yes No | | Comments |
| 1. **LICENSE PLATE BRACKET:**   One (1) stainless steel license plate bracket shall be provided at the rear bumper. The bracket shall have a LED light. |  |  |  |
| Technical specifications | Conform  Yes No | | Comments |
| 1. **TAIL LIGHTS:**   One (1) **Whelen M6BTT light, one (1) Whelen M6T amber LED light and one Whelen M6BUW white LED** light shall be installed in a black housing in a horizontal position each side at rear and wired with weatherproof connectors. |  |  |  |
| Light functions shall be as follows:   * **L.E.D**. red running light with red brake light in upper position. |  |  |  |
| * **L.E.D**. amber populated arrow pattern turn signal in middle position. |  |  |  |
| * **L.E.D**. white backup light in lower position. |  |  |  |
| A one-piece black aluminum trim casting shall be mounted around the three (3) individual lights in a horizontal position. |  |  |  |
| Technical specifications | Conform  Yes No | | Comments |
| 1. **MID BODY TURN SIGNALS:**   One (1) pair of mid body turn signals shall be provided. The rectangular LED lights shall be 4" x 6" in dimension. The location of the turn lights shall be at mid-body near the rear wheel axle. |  |  |  |
| Technical specifications | Conform  Yes No | | Comments |
| 1. **PUMP PANEL GROUND LIGHTS:**   Two (2) LED ground lights shall be installed under the pump panel running boards. |  |  |  |
| One (1) light shall be located on the driver's side and one (1) light located on the officer's side of the apparatus. |  |  |  |
| Technical specifications | Conform  Yes No | | Comments |
| 1. **REAR STEP GROUND LIGHTS:**   Two (2) LED ground lights shall be installed under rear step of the apparatus. |  |  |  |
| The ground lights shall automatically activate when the apparatus headlights are operating. |  |  |  |
| Technical specifications | Conform  Yes No | | Comments |
| 1. **REAR TAILBOARD LIGHTS:**   Two (2) LED step lights with clear lens shall be installed to illuminate the step surfaces at the rear of the apparatus body. |  |  |  |
| Technical specifications | Conform  Yes No | | Comments |
| 1. **STEP LIGHT:**   Two (2) LED step light with clear lens shall be installed to illuminate the side running boards. |  |  |  |
| The step/walkway light switch shall be installed and wired to a switch on the pump panel. |  |  |  |
| Technical specifications | Conform  Yes No | | Comments |
| 1. **DECK LIGHTS:**   The deck lights shall be installed at the front and at the rear of the hose bed. |  |  |  |
| There shall be four lights total. |  |  |  |
| Two at the front of the hose bed and two at the rear of the hose bed. |  |  |  |
| The lights shall be Fire research model **SOBRITE LED** and each have 7000 lumens. |  |  |  |
| Technical specifications | Conform  Yes No | | Comments |
| 1. **SCENE LIGHTS:**   **Scene Lights**  Two (2) FRC SPA 900 **LED** scene lights shall be provided.  Lights shall be located up high on rear access door and switched in the cab (side facing lights switched separately). |  |  |  |
| **Scene Lights**  Fire Research model **SPA900-Q70** surface mount lights shall be installed. The lights shall be mounted with four (4) screws to a flat surface. It shall be 6-3/4" high by 9" 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 light. |  |  |  |
| Each light 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. The light housing shall be aluminum with a black colored bezel. |  |  |  |
| Lights shall be located (1) each side of cab, rearward of forward doors, up high. |  |  |  |
| **Crosslay Light**  An Optronics round LED light model **TLL44** shall be installed at the rear area of the crosslay to provide crosslay lighting per current **NFPA 1901.** |  |  |  |
| The light shall provide 720 lm effective output. The light shall have a powder coated, die cast aluminum housing and stainless steel hardware with a weatherproof rating of **IP69K.** |  |  |  |
| The crosslay light shall be switched with the work light switch in the cab. |  |  |  |
| Technical specifications | Conform  Yes No | | Comments |
| 1. **TELESCOPIC LIGHTS:**   A set of telescopic lights shall be installed on the back of the apparatus cab. They shall be 120 volts and be swivel. The lights shall be FRC Spectra 28000 lumens LED. |  |  |  |
| Technical specifications | Conform  Yes No | | Comments |
| 1. **FLUID DATA PLAQUE:**   One (1) fluid data plaque containing required information shall be provided based on the applicable components for this apparatus, compliant with NFPA Standards: |  |  |  |
| * Engine oil |  |  |  |
| * Engine coolant |  |  |  |
| * Chassis transmission fluid |  |  |  |
| * Drive axle lubricant |  |  |  |
| * Power steering fluid |  |  |  |
| * Pump transmission lubrication fluid |  |  |  |
| * Other NFPA applicable fluid levels or data as required |  |  |  |
| Location shall be in the driver's compartment or on driver's door. |  |  |  |
| Technical specifications | Conform  Yes No | | Comments |
| 1. **DATA & WARNING LABELS:**   **HEIGHT LENGTH & WEIGHT**  A highly visible label indicating the overall height, length, and weight of the vehicle shall be installed in the cab dash area. |  |  |  |
| **CAB SEATING POSITION LIMITS**  The label shall also include the seating positions for firefighters. A weight allowance of 250 pounds for each shall be factored into the gross vehicle weight rating of the chassis. |  |  |  |
| **NO RIDE LABEL**  One (1) **"NO RIDERS**" label shall be applied on the vehicle at the rear step area or other applicable areas. The label shall warn personnel that riding in or on these areas, while the vehicle is in motion is prohibited. |  |  |  |
| **TIRE PRESSURE PLAQUE**  A label shall be placed in a visible area that indicates the front and rear tire pressure |  |  |  |
| **HELMET WARNING TAG**  One (1) label shall be installed in the cab, visible from each seating position. The label shall read **"CAUTION: DO NOT WEAR HELMET WHILE SEATED."** Helmets must be properly stowed while the vehicle is in motion according to the current edition of **NFPA 1901** |  |  |  |
| Technical specifications | Conform  Yes No | | Comments |
| 1. **FIRE PUMP:**   A new fire pump will be assembled and installed on the chassis and will comply with all **NFPA and ULC** standards. |  |  |  |
| The pump will be tested at its manufacturing plant by an **external firm (third party) Underwriters Laboratory (UL) in a**  **1901 Edition 2016** and this prior to its  Installation on the truck**. (NO EXCEPTION)** |  |  |  |
| The pump shall be a midship-mounted **Hale QMAX** single stage centrifugal pump. The pump shall be mounted on the chassis frame rails of commercial or custom truck chassis and have the capacity of **1500** gallons per minute **(U.S. GPM) NFPA 1901** rated performance, and shall be split-shaft driven from the truck transmission. |  |  |  |
| The fire pump shall be certified for **1050 IGPM** |  |  |  |
| The entire pump body and related parts shall be of fine grain alloy cast iron, with a minimum tensile strength of 30,000 psi (207 MPa). All metal moving parts in contact with water shall be of high quality bronze or stainless steel. |  |  |  |
| Pump body shall be horizontally split in two sections, for easy removal of impeller assembly including wear rings and bearings from beneath the pump without disturbing pump mounting or piping. |  |  |  |
| The pump impeller shall be hard, fine grain bronze of the mixed flow design and shall be individually ground and hand balanced. |  |  |  |
| Impeller clearance rings shall be bronze, easily renewable without replacing impeller or pump volute body, and of wrap-around double  labyrinth design for maximum efficiency. |  |  |  |
| The pump shaft shall be heat-treated, corrosion-resistant stainless steel and shall be rigidly supported by three (3) bearings for minimum deflection. 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 shall be splash-lubricated. Pump shaft must be sealed with double-lip oil seal to keep road dirt and water out of the gearbox. |  |  |  |
| Two (2) 6” diameter suction ports with 6” NST male threads and removable screens shall be provided, one each side. The ports shall be mounted one (1) on each side of the midship pump and shall extend through the side pump panels. Inlets shall come equipped with long handle chrome caps. |  |  |  |
| Two (2) test plugs shall be pump panel mounted for third party testing of vacuum and pressures of the pump. |  |  |  |
| A master drain valve shall be installed and operated from the pump operator`s panel. The master pump drain assembly shall consist of a Class 1 bronze master drain with a rubber disc seal and turning handle. |  |  |  |
| The manual master drain valve shall have six (6) individually-sealed ports that allow quick and simultaneous draining of multiple intake and discharge lines. It shall be constructed of corrosion-resistant material and be capable of operating at a pressure of up to 600 psi.  The master drain shall provide independent ports for low point drainage of the fire pump and auxiliary devices. |  |  |  |
| The midship pump shall be equipped with a high quality, spring loaded, self-adjusting mechanical seal capable of providing a positive seal to atmosphere under all pumping conditions. This positive seal to atmosphere must be achievable under vacuum conditions up to 26 Hg (draft) or positive suction pressures up to 250 psi. |  |  |  |
| The mechanical seal assembly shall be 2 inches in diameter and consist of a carbon sealing ring, stainless steel coil spring, Viton rubber boot, and a tungsten carbide seat, with a Teflon back-up seal provided. |  |  |  |
| Only one mechanical seal shall be required, located on the first stage suction (inboard) side of the pump and be designed to be compatible with a one-piece pump shaft (no exceptions). A continuous cooling flow of water from the pump shall be directed through the seal chamber when the pump is in operation |  |  |  |
| Technical specifications | Conform  Yes No | | Comments |
| 1. **FIRE PUMP COOLING:**   The pump shall have a 3/8” line installed from the pump discharge to the booster tank to allow a small amount of water to circulate through the pump casing in order to cool the pump during sustained periods of pump operation when water is not being discharged. The pump cooler line shall be controlled from the pump operator`s panel by a Innovative Controls 1/4 turn valve with "T" handle. Each 1/4 turn handle grip shall feature built-in color-coding labels and a verbiage tag |  |  |  |
| An engine cooler used to lower engine water temperature during prolonged pumping operations and controlled at the pump operator`s panel shall be provided. |  |  |  |
| The engine cooler shall be installed in the engine coolant system in such a manner as to allow cool pump water to circulate around engine water, thus forming a true heat  exchanger action. Cooler inlet and outlet shall be continuous, preventing intermixing of engine coolant and pump water. |  |  |  |
| Technical specifications | Conform  Yes No | | Comments |
| 1. **GEARBOX COOLER:**   A gearbox cooler shall be provided to maintain safe operating temperatures during prolonged pumping operations for pump rating 1500 GPM and over. |  |  |  |
| Technical specifications | Conform  Yes No | | Comments |
| 1. **PUMP ANODES:**   There shall be sacrificial, zinc anodes in the pump steamer ports which shall protect the pump and piping from electrolysis. These anodes shall also act as screens. |  |  |  |
| Technical specifications | Conform  Yes No | | Comments |
| 1. **PRIMER – AUTOMATIC:**   An automatic fire pump priming system shall be provided and installed. The system shall be oil-less type and environmentally safe.  Once engaged, the system shall be fully automatic and not require any action from the pump operator/engineer when pump draft is lost. This feature provides an additional safety margin by maintaining pump flow from the available water source automatically during drafting operations. When air is introduced during a drafting operation from conditions such as whirlpools or turbulence from porta-tank refill operations, the priming system shall automatically engage to remove the air and stabilize water flow and pump pressure. For additional safety, the entire system shall operate at less than 70dBA of ambient noise. |  |  |  |
| The priming system shall engage automatically whenever the pump discharge falls below five (5) psi and shall remain engaged until a pump prime has been achieved. The priming system shall automatically disengage when a positive pump discharge pressure has been established. |  |  |  |
| The electrical current draw from the chassis batteries shall not exceed four (4) amps at any given time of operation and allow for unlimited run time without causing an overheat condition for of any of the system components. |  |  |  |
| A single engagement switch shall be provided on the pump control panel that will allow the operator to engage the automatic pump priming system. There shall be a light provided on the pump control panel to indicate when the system is engaged. The pump shall be capable of taking suction and discharging water with a lift of 10 feet in not more than 30 seconds with the pump dry, through 20 feet of suction hose of appropriate size. The priming system shall comply with applicable sections of NFPA standards. |  |  |  |
| Technical specifications | Conform  Yes No | | Comments |
| 1. **PRIMER CONTROL:**   A push button switch control shall be provided on the pump operator's panel, for the main pump primer control. |  |  |  |
| One (1) additional primer control valve shall be furnished to prime the left suction line plumbing. |  |  |  |
| The Trident Emergency products RPV (remote priming valve) shall activate using the same air that powers the AirPrime system when the coinciding panel valve is depressed. Priming the remote suction line evacuates air from that line and minimizes cavitation during remote suction operations. The valve control is to be co-located next to the main priming valve control on the pump operator's panel. Two push buttons switches controls shall be provided on the pump operator's panel. |  |  |  |
| Technical specifications | Conform  Yes No | | Comments |
| 1. **PRESSURE GOVERNOR AND ENGINE-PUMP MONITORING:**   One (1) Fire Research InControl series TGA400 pressure governor and monitoring display kit shall be installed. The kit shall include a control module, intake pressure sensor, discharge pressure sensor, and cables. The control module case shall be waterproof and have dimensions not to exceed 5 1/2" high by 10 1/2" wide by 2" deep. The control knob shall be 2" in diameter with no mechanical stops, have a serrated grip, and a red idle push button in the center. It shall not extend more than 1 3/4" from the front of the control module. Inputs for monitored information shall be from a J1939 databus or independent sensors. Outputs for engine control shall be on the J1939 databus or engine specific wiring. |  |  |  |
| The following continuous displays shall be provided: |  |  |  |
| * Pump discharge; shown with four daylight bright LED digits more than 1/2" high |  |  |  |
| * Pump Intake; shown with four daylight bright LED digits more than 1/2" high |  |  |  |
| * Pressure / RPM setting; shown on a dot matrix message display |  |  |  |
| * Pressure and RPM operating mode LEDs |  |  |  |
| * Throttle ready LED |  |  |  |
| * Engine RPM; shown with four daylight bright LED digits more than 1/2" high |  |  |  |
| * Check engine and stop engine warning LEDs |  |  |  |
| * Oil pressure; shown on a dual color (green/red) LED bar graph display |  |  |  |
| * Engine coolant temperature; shown on a dual color (green/red) LED bar graph display |  |  |  |
| * Transmission Temperature: shown on a dual color (green/red) LED bar graph display |  |  |  |
| * Battery voltage; shown on a dual color (green/red) LED bar graph display. |  |  |  |
| The dot-matrix message display shall show diagnostic and warning messages as they occur. It shall show monitored apparatus information, stored data, and program options when selected by the operator. All LED intensity shall be automatically adjusted for day and night time operation. |  |  |  |
| The program shall store the accumulated operating hours for the pump and engine to be displayed with the push of a button. It shall monitor inputs and support audible and visual warning alarms for the following conditions: |  |  |  |
| * High Battery Voltage |  |  |  |
| * Low Battery Voltage (Engine Off) |  |  |  |
| * Low Battery Voltage (Engine Running) |  |  |  |
| * High Transmission Temperature |  |  |  |
| * Low Engine Oil Pressure |  |  |  |
| * High Engine Coolant Temperature |  |  |  |
| * Out of Water (visual alarm only) |  |  |  |
| * No Engine Response (visual alarm only). |  |  |  |
| The program features shall be accessed via push buttons and a control knob located on the front of the control panel. There shall be a USB port located at the rear of the control module to upload future firmware enhancements. |  |  |  |
| Inputs to the control panel from the pump discharge and intake pressure sensors shall be electrical. The discharge pressure display shall show pressures from 0 to 600 psi. The intake pressure display shall show pressures from -30 in. Hg to 600 psi. |  |  |  |
| The governor shall operate in two control modes, pressure and RPM. No discharge pressure or engine RPM variation shall occur when switching between modes. A throttle ready LED shall light when the interlock signal is recognized. The governor shall start in pressure mode and set the engine RPM to idle. In pressure mode, the governor shall automatically regulate the discharge pressure at the level set by the operator. In RPM mode, the governor shall maintain the engine RPM at the level set by the operator except in the event of a discharge pressure increase. The governor shall limit a discharge pressure increase in RPM mode to a maximum of 30 psi. Other safety features shall include recognition of no water conditions with an automatic programmed response and a push button to return the engine to idle. |  |  |  |
| The pressure governor, monitoring and master pressure display shall be programmed to interface with a specific engine. |  |  |  |
| Technical specifications | Conform  Yes No | | Comments |
| 1. **PUMP SHIFT:**   The pump shift shall be pneumatically-controlled using a power shifting cylinder.  The power shift control valve shall be mounted in the cab and be labeled**” PUMP SHIFT”.** |  |  |  |
| The apparatus transmission shift control shall be furnished with a positive lever, preventing accidental shifting of the chassis transmission. |  |  |  |
| A green indicator light shall be located in the cab and be labeled” **PUMP ENGAGED”.** The light shall not activate until the pump shift has completed its full travel into pump engagement position. |  |  |  |
| A second green indicator light shall be located in the cab and be labeled” OK **TO PUMP”.** This light shall be energized when both the pump shift has been completed and the chassis automatic transmission has obtained converter lock-up (4th gear lock-up). |  |  |  |
| Technical specifications | Conform  Yes No | | Comments |
| 1. **MIDSHIP FIRE PUMP DRIVESHAFTS AND INSTALLATION:**   The midship fire pump shall be installed and shall include installation of the fire pump, modification and/or fabrication of new drivelines and all pump-mounting brackets. |  |  |  |
| Technical specifications | Conform  Yes No | | Comments |
| 1. **PUMP PLUMBING SYSTEM:**   The fire pump plumbing system shall be of rigid stainless steel pipe or flexible piping with stainless steel fittings. Mechanical grooved couplings shall be installed to permit flexing of the plumbing system and allow for quick removal of piping or valves for service. Flexible hose couplings shall be threaded stainless steel or mechanical grooved coupling connections. |  |  |  |
| The fire pump and plumbing shall be hydrostatically tested in compliance to applicable sections of NFPA standards. The test results shall be included in the delivery documentation. |  |  |  |
| Technical specifications | Conform  Yes No | | Comments |
| 1. **HOSE THREADS:**   The hose threads shall be National Standard Thread (NST) on all base threads on the apparatus intakes and discharges |  |  |  |
| Technical specifications | Conform  Yes No | | Comments |
| 1. **FIRE PUMP MASTER DRAIN:**   A master drain valve shall be installed and operated from driver side. The master pump drain assembly shall consist of a Class 1 bronze master drain with a rubber disc seal and turning handle. The master drain shall be located in the heat pan and a remote handle control knot shall be locate below running board on driver side or L1 compartment. |  |  |  |
| The manual Master Drain Valve shall have twelve (12) individually-sealed ports that allow quick and simultaneous draining of multiple intake and discharge lines.  It shall be constructed of corrosion-resistant material and be capable of operating at a pressure of up to 600 PSI. |  |  |  |
| The master drain shall provide independent ports for low point drainage of the fire pump and auxiliary devices. |  |  |  |
| Technical specifications | Conform  Yes No | | Comments |
| 1. **PUMP DRAINS:**   An Innovative Controls ¾” cast bronze quarter-turn drain/bleeder valve shall be installed. The valve shall be complete with a chrome plated bronze ball, reinforced teflon seals, and blow-out proof stem rated to 600 PSI. A chrome plated zinc handle shall be provided on each drain valve complete with a recessed ID label provision. The handle shall lift, to open and push down, to close. |  |  |  |
| Technical specifications | Conform  Yes No | | Comments |
| 1. **ADDITIONAL LOW POINT DRAINS:**   The plumbing system shall be equipped with additional low point manually operated drain valves to allow total draining of the fire pump plumbing system. These valves shall be accessible from the side of the vehicle and labeled. |  |  |  |
| Technical specifications | Conform  Yes No | | Comments |
| 1. **FIRE PUMP AIR BLOWOUT:**   One (1) air blow out shall be provided for the fire pump. The air supply must be supplied from chassis air system and be connected to a quarter turn valve located on the pump operator's panel. |  |  |  |
| Technical specifications | Conform  Yes No | | Comments |
| 1. **PUMP 6 IN INTAKES:**   One (1) 6” suction intake shall be installed on the left side pump panel to supply the fire pump from an external water supply. The threads shall be 6" NST. The intake shall be provided with a removable screen |  |  |  |
| One (1) 6" chrome plated cap shall be provided. The threads shall be NST and the cap shall be equipped long handles |  |  |  |
| One (1) 6" suction intake shall be installed on the right-side pump panel to supply the fire pump from an external water supply. The intake shall be provided with a removable screen. |  |  |  |
| One (1) 6" chrome plated cap shall be provided. The threads shall be NST and the cap shall be equipped long handles. |  |  |  |
| A pressure dump/relief valve shall be included that is factory pre-set at 125 PSI and field adjustable from 75 to 250 PSI. The pressure dump/relief valve shall provide over-pressure protection for the suction hose even when the intake valve is closed. The outlet of the dump/relief valve shall be 2.5" in diameter to allow directing the discharge flow away from the pump operator's position. |  |  |  |
| An inlet fitting with 6" NST thread shall be provided, complete with a removable strainer screen. |  |  |  |
| The driver side intake shall have a Hale Master Intake Valve (MIV-E). |  |  |  |
| The large diameter inlet valve shall be capable of achieving an NFPA test rating of 1500 GPM through a single 6” suction hose. |  |  |  |
| The inlet valve shall be operated by a 12 VDC electric motor with a remote switch provided at the pump operator`s position. The 12 VDC motor shall be provided with an automatic resetting, thermally-compensated over-current protection circuit breaker to protect the 12 VDC motor and apparatus electrical system. |  |  |  |
| The gear actuator on the valve will cycle from full closed to full open in not less than three (3) seconds. A hand controlled pump panel mounted manual override (knob style) shall be provided. |  |  |  |
| An indicator light panel shall be located at the pump operator`s position to show valve open, closed, or traversing from open to closed. |  |  |  |
| A 3/4” air bleeder valve shall be provided and controlled at the pump operator`s position. |  |  |  |
| A 1/4” water bleeder shall be supplied and controlled at the pump operator`s position. |  |  |  |
| Technical specifications | Conform  Yes No | | Comments |
| 1. **LEFT SIDE -- 2-1/2" GATED INTAKE:**   One (1) 2-1/2" gated suction intake shall be installed on left side pump panel to supply the fire pump from an external water supply. The control valve shall be a quarter turn ball valve and shall have 2-1/2" QST female thread of chrome plated brass. |  |  |  |
| The intake shall be equipped with a ¾" drain and bleeder valve. An identification label and removable screen shall be installed. |  |  |  |
| One (1) 2-1/2" chrome plated plug shall be provided. The threads shall be QST and the plug shall be equipped rocker lugs and chain or cable securement. |  |  |  |
| The valve shall be an Elkhart two and one half-inch (2-1/2") swing-out ball valve. The valve shall have an all brass body with flow optimizing stainless steel ball and dual polymer seats. The valves shall be capable of bi-directional flow and incorporating a self-locking ball. The valve shall not require lubrication of seats or any other internal waterway parts, and be capable of swinging out of the waterway for maintenance. |  |  |  |
| The valve shall be equipped with one (1) manually operated, swing-type manual control located adjacent the intake. The control handle shall be equipped with self-locking feature. The valve shall be equipped with a color-coded name plate. |  |  |  |
| Technical specifications | Conform  Yes No | | Comments |
| 1. **INTAKE RELIEF/DUMP VALVE:**   One (1) TFT A18 series, 2-1/2" intake relief/dump valve pre-set at 125 psi shall be permanently installed on the suction side of the fire pump. The valve shall have an adjustment range of 75 psi to 250 psi, and shall be designed to automatically self-restore to a non-relieving position when excessive pressure is no longer present. |  |  |  |
| Discharge side of the intake relief valve shall be plumbed away from the pump operator. |  |  |  |
| Technical specifications | Conform  Yes No | | Comments |
| 1. **WATER TANK TO PUMP LINE:**   One (1) manually operated 3” Akron valve shall be installed between the pump suction and the booster tank in order to pump water from the tank. The valve control shall be located at the pump operator`s panel and shall visually indicate the position of the valve at all times. |  |  |  |
| The valve shall be an Akron 8800HD series with a 316-stainless steel ball and dual polymer seats for ease of operation and increased abrasion resistance. |  |  |  |
| The valve shall have a self-locking ball feature using an automatic friction lock design to balance the stainless-steel ball when in a throttle position and water is flowing through it.  The valve shall be of the unique Akron swing-out design to allow the valve body to be removed for servicing without disassembling the plumbing. |  |  |  |
| All fabricated piping shall be a minimum of Schedule 10 stainless steel for superior corrosion resistance and decreased friction loss. |  |  |  |
| Technical specifications | Conform  Yes No | | Comments |
| 1. **FIRE PUMP TO WATER TANK FILL LINE:**   One (1) 2” pump-to-tank fill line having a 2” manually operated full flow valve. The valve control shall be located at the pump operator`s panel and shall visually indicate the position of the valve at all times. The fill line shall be controlled using a chrome handle with an integral tag. |  |  |  |
| The valve shall be an Akron 8800HD series with a 316-stainless steel ball and dual polymer seats for ease of operation and increased abrasion resistance. The valve shall have a self-locking ball feature using an automatic friction lock design to balance the stainless-steel ball when in a throttle position with water flowing through it. |  |  |  |
| The valve shall be of unique Akron swing-out design to allow the valve body to be removed for servicing without disassembling the plumbing. |  |  |  |
| All fabricated piping shall be a minimum of Schedule 10 stainless steel for superior corrosion resistance and decreased friction loss. |  |  |  |
| Technical specifications | Conform  Yes No | | Comments |
| 1. **CANADIAN UNDERWRITERS LABORATORIES CERTIFICATION:**   The apparatus shall undergo a Canadian Underwriters Laboratories Incorporated inspection and test per current ULC standards, prior to delivery of the completed apparatus. These tests shall include pump, tank, weight, brake, and other applicable ULC inspection and testing. The test shall be performed on site by UL/ULC staff and shall include a listing of the apparatus as a fire fighting appliance. The manufacturer shall be ULC certified as a listed fire firefighting appliance manufacturer. |  |  |  |
| The ULC acceptance certificate and listing label shall be furnished with the apparatus on delivery. |  |  |  |
| The pump shall be tested as IPGM (Imperial Gallons per Minute). |  |  |  |
| Technical specifications | Conform  Yes No | | Comments |
| 1. **CROSSLAY DISCHARGES:**   One (1) single crosslay discharge shall be provided at the front area of the body. The crosslay shall include one (1) 2” brass swivel with a 1-1/2” hose connection to permit the use of hose from either side of the apparatus. |  |  |  |
| The crosslay hose bed shall consist of a 2” heavy-duty hose coming from the pump discharge manifold to the 2” swivel. The hose shall be connected to a manually operated 2” Akron valve. The valve shall be an Akron 8800HD series with a 316-stainless steel ball and dual polymer seats for ease of operation and increased abrasion resistance. The valve shall have a self-locking ball feature using an automatic friction lock design to balance the stainless-steel ball when in a throttle position with water flowing through it.  The valve shall be of the unique Akron swing-out design to allow the valve body to be removed for servicing without disassembling the plumbing. |  |  |  |
| The valve control shall be located at the pump operator`s panel and shall visually indicate the position of the valve at all times.  All fabricated piping shall be a minimum of Schedule 10 stainless steel for superior corrosion resistance and decreased friction loss. |  |  |  |
| One (1) single crosslay discharge shall be provided at the front area of the body |  |  |  |
| The crosslay shall have one (1) 2-1/2” mechanical swivel hose connection to permit the use of the hose from either side of the apparatus. |  |  |  |
| The crosslay hose bed shall consist of a 2-1/2” heavy-duty hose coming from the pump discharge manifold to the 2-1/2” swivel. The hose shall be connected to a manually operated 2-1/2” Akron valve. |  |  |  |
| The valve shall be an Akron 8800HD series with a 316-stainless steel ball and dual polymer seats for ease of operation and increased abrasion resistance. The valve shall have a self-locking ball feature using an automatic friction lock design to balance the stainless-steel ball when in a throttle position with water flowing through it. |  |  |  |
| The valve shall be of the unique Akron swing-out design to allow the valve body to be removed for servicing without disassembling the plumbing. |  |  |  |
| The valve control shall be located at the pump operator`s panel and shall visually indicate the position of the valve at all times. |  |  |  |
| All fabricated piping shall be a minimum of Schedule 10 stainless steel for superior corrosion resistance and decreased friction loss. |  |  |  |
| Technical specifications | Conform  Yes No | | Comments |
| 1. **CROSSLAY HINGED COVER WITH END FLAPS:**   The crosslay hosebed shall be equipped with a single aluminum diamond plate hinged cover with vinyl end flaps with hook & loop fasteners. The cover shall have rubber bumpers, latching devices, and lift up handle on each end of the cover. |  |  |  |
| The hosebed cover shall be labeled, "Not a Standing or Walking Surface", per NFPA. |  |  |  |
| The cover shall be black in color. |  |  |  |
| Technical specifications | Conform  Yes No | | Comments |
| 1. **ROLLERS FOR CROSSLAY HOSE BED:**   The crosslay hosebed shall be equipped stainless steel "U" shaped roller system, one on each end of the hosebed. |  |  |  |
| Technical specifications | Conform  Yes No | | Comments |
| 1. **LEFT SIDE PUMP PANEL -- 2-1/2" DISCHARGE:**   One (1) 2-1/2” discharge outlet with a manually operated Akron valve shall be provided at the left-hand side pump panel. |  |  |  |
| The valve shall be an Akron 8800HD series with a 316-stainless steel ball and dual polymer seats for ease of operation and increased abrasion resistance. The valve shall have a self-locking ball feature using an automatic friction lock design to balance the stainless-steel ball when in a throttle position and water is flowing through it. |  |  |  |
| The valve shall be of the unique Akron swing-out design to allow the valve body to be removed for servicing without disassembling the plumbing. |  |  |  |
| The valve control shall be located at the pump operator panel and shall visually indicate the position of the valve at all times. |  |  |  |
| The discharge shall extend out beyond the pump panel with a 30-degree downward angle with 2-1/2” NST threads to help prevent kinking of the discharge hose. The 30-degree drop shall be an integral part of the discharge valve and shall be equipped with a chrome plated rockerlug cap with a retainer chain. |  |  |  |
| The discharge shall be supplied with a 3/4” drain valve assembly. |  |  |  |
| The drain shall be installed to drain water from the gauge pressure line to prevent freezing of the line. The drain shall be controlled with a quarter-turn valve on the pump panel. |  |  |  |
| All fabricated piping shall be a minimum of Schedule 10 stainless steel for superior corrosion resistance and decreased friction loss. |  |  |  |
| Technical specifications | Conform  Yes No | | Comments |
| 1. **RIGHT SIDE PUMP PANEL -- 2-1/2" DISCHARGE:**   One (1) 2-1/2” discharge outlet with a manually operated Akron valve shall be provided at the right-side pump panel. |  |  |  |
| The valve shall be an Akron 8800HD series with a 316-stainless steel ball and dual polymer seats for ease of operation and increased abrasion resistance. |  |  |  |
| The valve shall have a self-locking ball feature using an automatic friction lock design to balance the stainless-steel ball when in a throttle position with water flowing through it. |  |  |  |
| The valve shall be of the unique Akron swing-out design to allow the valve body to be removed for servicing without disassembling the plumbing. |  |  |  |
| The valve control shall be located at the pump operator panel and shall visually indicate the position of the valve at all times. |  |  |  |
| All fabricated piping shall be a minimum of Schedule 10 stainless steel for superior corrosion resistance and decreased friction loss.  Location: right side discharge 2. |  |  |  |
| Technical specifications | Conform  Yes No | | Comments |
| 1. **RIGHT SIDE PUMP PANEL -- 3" x 4" DISCHARGE:**   One (1) 4” discharge outlet with a 3” manually operated Akron valve shall be provided at the right-side pump panel. The discharge shall consist of a 3” valve connected with 30-degree droop to a 3” FNST x 4” MNST colour coded adapter. |  |  |  |
| The end of the discharge adapter shall be equipped with a chrome plated rockerlug cap with a retainer cable. |  |  |  |
| The valve shall be an Akron 8800HD series with a 316-stainless steel ball and dual polymer seats for ease of operation and increased abrasion resistance. The valve shall have a self-locking ball feature using an automatic friction lock design to balance the stainless-steel ball when in a throttle position with water flowing through it. |  |  |  |
| The valve shall be of the unique Akron swing-out design to allow the valve body to be removed for servicing without disassembling the plumbing. |  |  |  |
| The valve control shall be located at the pump operator`s panel and shall visually indicate the position of the valve at all times. |  |  |  |
| All fabricated piping shall be a minimum of Schedule 10 stainless steel for superior corrosion resistance and decreased friction loss.  Location: right side discharge 1. |  |  |  |
| Technical specifications | Conform  Yes No | | Comments |
| 1. **DISCHARGE WATERWAY 4:**   One (1) 4” diameter discharge outlet with an electrically operated Akron valve shall be connected from the pump to the aerial waterway. |  |  |  |
| The valve shall be an Akron 8600HD series with 316 stainless ball and polymer seals for ease of operation and increased abrasion resistance. The valve shall have a self-locking ball feature using an automatic friction lock design to balance the chrome-plated brass ball when in a throttle position with water flowing through it. The valve shall be of the unique Akron Swing-out design to allow the valve body to be removed for servicing without disassembling the plumbing. |  |  |  |
| The valve shall utilize an electric driven worm gear actuator with a Navigator 9323 controller. The 9323 controller shall be located at the pump operator`s panel and contain indicator lights for open, closed and throttled valve positions. The valve may also be operated manually in case of electrical system failure. |  |  |  |
| The valve controls and indicators shall be located at the pump operator`s panel.  All fabricated piping shall be a minimum of Schedule 10 stainless steel for superior corrosion resistance and decreased friction loss. |  |  |  |
| Technical specifications | Conform  Yes No | | Comments |
| 1. **SIDE MOUNT PUMP ENCLOSURE:**   The side mount pump enclosure shall be removable and supported from the chassis frame rails. |  |  |  |
| This enclosure will allow independent flexing of the pump enclosure from the body and allow for quick removal. The support structure shall be constructed of extruded aluminum tubing and angle. |  |  |  |
| All pump suction and discharge controls are to be mounted on the driver side pump operator's panel so as to permit operation of the pump from a central location. The fire pump, valves and controls shall be accessible for service and maintenance as required by applicable sections of **NFPA** standards. |  |  |  |
| The "master" gauges shall be suitably enclosed and mounted on a full pump compartment width "hinged" gauge panel constructed of the same material as the pump operators control panel, allowing access to the backside of all gauges and gauge lines. The individual gauges shall be mounted inline with the control handle or adjacent to the control handle. Panel is to include a stainless-steel piano hinge, flush mounted chrome plated trigger latch, and stainless steel cable end stops. Electrical wiring and all gauge lines shall be properly tie wrapped to prevent kinking or cutting of the lines when the panel is opened. |  |  |  |
| The following controls and equipment as specified in the specifications, shall be provided on the pump panel or within the pump enclosure: |  |  |  |
| * Primer. |  |  |  |
| * Pump and plumbing area service lights. |  |  |  |
| * Pressure control device and throttle control. |  |  |  |
| * Fire pump and engine instruments. |  |  |  |
| * Pump intakes and discharge controls. |  |  |  |
| * Master intake and discharge gauges. |  |  |  |
| * Tank fill control. |  |  |  |
| * Tank suction control. |  |  |  |
| * Water tank level gauge. |  |  |  |
| * Pump panel lights. |  |  |  |
| Technical specifications | Conform  Yes No | | Comments |
| 1. **30 DEGREE ELBOWS AND DISCHARGE CAPS:**   All 30 degree elbows and discharge caps shall be color coded. |  |  |  |
| Technical specifications | Conform  Yes No | | Comments |
| 1. **IC PUSH/PULL CONTROL:**   The apparatus pump panel shall be equipped with Innovative Controls Side Mount Valve Controls. The ergonomically designed ¼ turn push-pull T-handle shall be chrome-plated zinc with recessed labels for color-coding and verbiage. An anodized aluminum control rod and housing shall, together with a stainless spring steel locking mechanism, eliminate valve drift. |  |  |  |
| Teflon impregnated bronze bushings in both ends of the rod housing shall minimize rod deflection, never need lubrication, and ensure consistent long-term operation. The control assembly shall include a decorative chrome-plated zinc panel-mounting bezel with areas for color-coding |  |  |  |
| Innovative Controls intake and/or discharge swing handle bezels shall be installed to the apparatus with mounting bolts. These bezel assemblies will be used to identify intake and/or discharge ports with color and verbiage. |  |  |  |
| These bezels are designed and manufactured to withstand the specified apparatus service environment and shall be backed by a warranty equal to that of the exterior paint and finish. The specified assemblies feature a chrome-plated panel-mount bezel with durable UV resistant polycarbonate inserts. |  |  |  |
| These UV resistant polycarbonate graphic inserts shall be sub-surface screen printed to eliminate the possibility of wear and protect the inks from fading. |  |  |  |
| All insert labels shall be backed with 3M permanent adhesive (200MP), which meets UL969 and NFPA standards. |  |  |  |
| Technical specifications | Conform  Yes No | | Comments |
| 1. **LEFT SIDE RUNNING BOARD -- AGRESSIVE SURFACE:**   The left side mount pump panel shall be equipped with side running board. The running board will extend along the width of the pump enclosure from the forward end of the body module to behind the chassis cab. |  |  |  |
| The running board shall be constructed of aluminum treadplate with grip style inserts, bolted in place with stainless steel fasteners. The step surfaces shall be with compliance to applicable sections of **NFPA** requirements. |  |  |  |
| Technical specifications | Conform  Yes No | | Comments |
| 1. **RIGHT SIDE RUNNING BOARD -- AGRESSIVE SURFACE:**   The right-side mount pump panel shall be equipped with side running board. The running board will extend along the width of the pump enclosure from the forward end of the body module to behind the chassis cab. |  |  |  |
| The running board shall be constructed of aluminum treadplate with grip style inserts, bolted in place with stainless steel fasteners. The step surfaces shall be in compliance with applicable sections of **NFPA** requirements.  It shall include a black Linex package. |  |  |  |
| Technical specifications | Conform  Yes No | | Comments |
| 1. **PUMP ENCLOSURE ACCESS DOOR -- RIGHT SIDE UPPER:**   A pump panel access door shall be provided on the upper right side of the side mount pump enclosure. The access door shall be approximately 18" high and as wide as possible. The door shall be constructed of aluminum tread plate with push button type latches. |  |  |  |
| Technical specifications | Conform  Yes No | | Comments |
| 1. **FRONT ACCESS PUMP PANELS:**   Two (2) removable access panels constructed of .125 aluminum treadplate material shall be provided at the front of the pump compartment. The access panels shall be flush mounted in the forward wall of the pump compartment. Each door shall have a bent "D"-ring type handle with dual locking pins on each side. |  |  |  |
| There shall be adequate space between the pump access panels for installation of a radio compartment or other equipment. |  |  |  |
| Technical specifications | Conform  Yes No | | Comments |
| 1. **PUMP PANEL:**   **Hinged Gauge Panel**  The driver side stainless steel single gauge panel shall be positioned where it can be opened downward for access to gauges and other interior pump module mounted items. The gauge panel shall include latches to secure the panel in the closed position. Two (2) cable tethers shall be provided to hold the panel in the open position. |  |  |  |
| **Thermo plastic Pump Panels**  The driver and officer side pump panels shall have a black thermo plastic finish. |  |  |  |
| **Pump Access Door**  The officer side pump module shall include an upper horizontally-hinged pump access door.  The compartment door shall be securely attached with a full-length stainless steel piano type hinge with 1/4” pins. |  |  |  |
| The hinge shall be” staked” on every other knuckle to prevent the pin from sliding. The door shall include two (2) push-button style latches to secure the door in the closed position and two (2) hold-open devices to hold the door in the open position. |  |  |  |
| The door shall have a thermo plastic finish the same color as the pump panels and of the same material. |  |  |  |
| Technical specifications | Conform  Yes No | | Comments |
| 1. **PUMP PANNEL AIR OUTLET:**   A 1/4” female air hose fitting shall be mounted with a 1/4” valve. The fitting and valve shall be connected to the air reservoir tank.  **Location: driver's side pump panel** |  |  |  |
| Technical specifications | Conform  Yes No | | Comments |
| 1. **PUMP PANEL STAINLESS STEEL TRIM PANELS:**   Stainless steel intake and discharge trim rings shall be installed to the apparatus with mounting bolts. These assemblies will be used to identify intake and discharge ports with color and verbiage, using separate identification tags protected by chrome plated bezels. These trim rings are designed and manufactured to withstand the environment and shall be backed by a warranty equal to that of the exterior paint and finish. All labels shall be backed with 3M permanent adhesive (200MP), which meets UL969 and **NFPA** standards. |  |  |  |
| Technical specifications | Conform  Yes No | | Comments |
| 1. **PUMP COMPARTMENT HEATER SYSTEM:**   Two (2) 24,000 BTU heaters shall be installed in the lower pump compartment area. |  |  |  |
| The heaters shall be connected to the chassis engine coolant system and shall include 12 volt blowers. The heaters shall be controlled at the pump operator`s panel. |  |  |  |
| Technical specifications | Conform  Yes No | | Comments |
| 1. **ARCTIC INSULATION PACKAGE:**   The entire pump compartment shall be insulated for heat retention. All four sides and the top shall be covered with a 1" closed cell foam with foil backing. Rubber booting shall be used as feasible to seal around plumbing and shafts going in and out of the pump house. |  |  |  |
| A removable casing constructed of galvanized steel, completely enclosing the underside of the pump compartment and heated by the engine exhaust shall be provided. The heat pan assembly shall include individual panels that can be easily removed from there mounting locations. The two-outer slide-out panels shall be bolted in place. |  |  |  |
| A flexible rubber gasket shall be installed between the pump compartment and the apparatus body. This gasket will be designed to seal the pump compartment to the apparatus body as tightly as practical. This gasket is necessary for winter operation in extremely cold climates |  |  |  |
| **Extreme Weather Heat Pan Extension Plates**  The heat pan shall have additional plates  mounted inside the lower pump module area. These plates shall increase the heat retention in the lower pump module area during extreme weather conditions. |  |  |  |
| **Heat Pan**  The pump compartment shall have a heat pan installed under the pump area. The heat pan shall be constructed of 1/8” (.125”) smooth aluminum plate and shall be easily removable for fair weather operations. |  |  |  |
| The area between the pump modules and body shall include a rubber flex joint. |  |  |  |
| Technical specifications | Conform  Yes No | | Comments |
| 1. **LABELS:**   Safety, information, data, and instruction labels for apparatus shall be provided and installed at the operator's instrument panel. |  |  |  |
| The labels shall include rated capacities, pressure ratings, and engine speeds as determined by the certification tests. The no-load governed speed of the engine, as stated by the engine manufacturer, shall also be included. |  |  |  |
| The labels shall be provided with all information and be attached to the apparatus prior to delivery. |  |  |  |
| Discharge and intake valve controls shall be color coded in compliance to guidelines of applicable sections of NFPA standards. |  |  |  |
| Innovative Controls permanent type nameplates and instruction panels shall be installed on the pump panel for safe operation of the pumping equipment and controls. |  |  |  |
| Technical specifications | Conform  Yes No | | Comments |
| 1. **PUMP PANEL LIGHTS:**   Six (6) LED pump panel lights shall be provided. The lights shall be located three (3) each side under a light shield directly above the left and right side pump panels. The lights shall be welded LED’s. |  |  |  |
| The light shields shall be formed from 14 gauge brushed finish stainless steel. The work light switch in the cab shall activate the lights when the park brake is set. |  |  |  |
| **Pump Panel Light**  An extra LED light shall be mounted under the light shield, in addition to the existing pump panel lights, directly above the pump panel. The light shall be switched with pump panel lights. |  |  |  |
| Technical specifications | Conform  Yes No | | Comments |
| 1. **PUMP ENGAGED LIGHT:**   One (1) pump panel light shall be illuminated at the time the fire pump is engaged into operation. The remaining lights shall be controlled by a switch located on the operator's instrument panel. |  |  |  |
| Technical specifications | Conform  Yes No | | Comments |
| 1. **MASTER DISCHARGE AND INTAKE GAUGES:**   Two (2) 4" (100mm) diameter class1 discharge pressure and intake gauges (Dual Scale PSI/kPa, 30"-0-600 PSI & -100-0-4140 kPa) shall be provided. The gauges will be located on the pump instrument panel. |  |  |  |
| The gauges shall be lite. The lighting shall be blue in color. |  |  |  |
| The master gauges shall have clear scratch resistant molded crystals with captive O-ring seals shall be used to ensure distortion free viewing and to seal the gauge. The gauges shall be filled with a synthetic mixture to dampen shock and vibration, lubricate the internal mechanisms, prevent lens condensation and ensure proper operation from –40F to +160F. Each gauge shall exceed ANSI B40.1 Grade A requirements with an accuracy of +/- 1.5% full scale and include a size appropriate phosphorous bronze bourdon tube with a reinforced lap joint and large tube base to increase the tube life and gauge accuracy. A polished chrome-plated brass bezel shall be provided to prevent corrosion and protect the lens and gauge case. |  |  |  |
| Technical specifications | Conform  Yes No | | Comments |
| 1. **TEST TAPS:**   Test taps for pump intake and pump pressure shall be provided on the pump instrument panel and be properly labeled. |  |  |  |
| Technical specifications | Conform  Yes No | | Comments |
| 1. **WATER TANK GAUGE:**   One (1) Innovative Controls brand water tank level gauge shall be located at the pump operator`s panel to provide a high-visibility display of the water tank level. Ten (10) high-intensity light emitting diodes (LED`s) on the display module shall have a 3-dimensional lens allowing the full, 3/4, 1/2, 1/4, and refill levels to be easily distinguished at a glance within full 180-degree visibility. |  |  |  |
| The display module shall be protected from vibration and contamination with the components being encased in an encapsulated plastic housing. The long life and extreme durability of LED indicators eliminates light bulb replacement and maintenance. Color coded cover plates shall complete the assembly of the display module to the pump panel. Each display level can be set independently for maximum reliability. |  |  |  |
| The display shall provide a steady indication of fluid level despite sloshing inside of the tank when the vehicle is in motion due to an “anti-slosh” feature. |  |  |  |
| Technical specifications | Conform  Yes No | | Comments |
| 1. **HANDRAIL SIDE PUMP PANEL:**   Four (4) extruded aluminum non-slip handrails, approximately 12" in length, shall be provided and vertically mounted, one (1) each side on the side pump panel on both sides. |  |  |  |
| The handrails shall have intergraded LED lighting |  |  |  |
| Technical specifications | Conform  Yes No | | Comments |
| 1. **WATER TANK – 500 USG IMPERIAL GALLON:**   The booster tank shall be T-shaped in configuration and shall have a useable capacity of 500 gallons (U.S.). |  |  |  |
| The booster tank shall be constructed of polypropylene material. The booster tank shall be completely removable without disturbing or dismounting the apparatus body structure. The top of the booster tank is fitted with removable lifting assembly designed to facilitate tank removal. |  |  |  |
| The booster tank top, sides, and bottom shall be constructed of a minimum 1/2” (0.50”) thick black UV-stabilized copolymer polypropylene. Joints and seams shall be fused using nitrogen gas as required and tested for maximum strength and integrity. |  |  |  |
| The tank construction shall include technology wherein a sealant shall be installed between the plastic components prior to being fusion welded. This sealing method will provide a liquid barrier offering leak protection in the event of a weld compromise. |  |  |  |
| The tank cover shall be constructed of 1/2" thick polypropylene and UV stabilized, to incorporate a multi-piece locking design, which allows for individual removal and inspection if necessary. |  |  |  |
| The tank cover(s) shall be flush or recessed 3/8" from the top of the tank and shall be fused to the tank walls and longitudinal partitions for maximum integrity. Each one of the covers shall have hold downs consisting of 2" minimum polypropylene dowels spaced a maximum of 40” apart. These dowels shall extend through the covers and will assist in keeping the covers rigid under fast filling conditions. |  |  |  |
| The tank shall have a combination vent and manual fill tower with a hinged lid. The fill tower shall be constructed of 1/2" polypropylene and shall be a typical dimension of 8" x 8" outer perimeter (subject to change for specific design applications). The fill tower shall be blue in color indicating that it is a water-only fill tower. The tower shall have a 1/4" thick removable polypropylene screen and a polypropylene hinged cover. The capacity of the tank shall be engraved on the top of the fill tower lid. |  |  |  |
| The booster tank shall have two (2) tank plumbing openings. One (1) for a tank-to-pump suction line with an anti-swirl plate, and one (1) for a tank fill line. All tank fill couplings shall be backed with flow deflectors to break up the stream of water entering the tank, and be capable of withstanding sustained fill rates per the tank fill inlet size. |  |  |  |
| The sump shall be constructed of a minimum of 1/2" polypropylene. The sump shall have a minimum 3" N.P.T. threaded outlet for a drain plug per NFPA. This shall be used as a combination clean-out and drain. All tanks shall have an anti-swirl plate located approximately 3” above the inside floor. |  |  |  |
| The transverse and longitudinal swash partitions shall be manufactured of a minimum of 3/8" polypropylene. All partitions shall be equipped with vent and air holes to permit movement of air and water between compartments. The partitions shall be designed to provide maximum water flow. All swash partitions interlock with one another and are completely fused to each other as well as to the walls of the tank. All partitions and spacing shall comply with NFPA 1901. The walls shall be welded to the floor of the tank providing maximum strength. |  |  |  |
| Inside the fill tower there shall be a combination vent/overflow pipe. The vent overflow shall be a minimum of schedule 40 polypropylene pipe with an I.D. of 3" or larger that is designed to run through the tank. This outlet shall direct the draining of overflow water past the rear axle, thus reducing the possibility of freeze-up of these components in cold environments. This drain configuration shall also assure that rear axle tire traction shall not be affected when moving forward. |  |  |  |
| The booster tank shall undergo extensive testing prior to installation in the truck. All water tanks shall be tested and certified as to capacity on a calibrated and certified tilting scale. |  |  |  |
| Each tank shall be weighed empty and full to provide precise fluid capacity. Each tank shall be delivered with a Certificate of Capacity delineating the weight empty and full and the resultant capacity based on weight. Engineering estimates for capacity calculations shall not be permitted for capacity certification. The tank must be designed and fabricated by a tank manufacturer that is ISO 9001:2008 certified in each of its locations. The ISO certification must be to the current standard in effect at the time of the design and fabrication of the tank. |  |  |  |
| A tag shall be installed on the apparatus in a convenient location and contain pertinent information including a QR code readable by commercially available smart phones. The information contained on the tag shall include the capacity of the water and foam (s), the maximum fill and pressure rates,  the serial number of the tank, the date of manufacture, the tank manufacturer, and contact information. The QR code will allow the user to connect with the tank manufacturer for additional information and assistance. |  |  |  |
| The tank shall have a limited Lifetime warranty that provides warranty service for the life of the fire apparatus in which the tank is installed. Warranties are transferable if the apparatus ownership changes by requesting the transfer from the tank manufacturer. |  |  |  |
| Technical specifications | Conform  Yes No | | Comments |
| 1. **WATER TANK DRAIN:**   One (1) 1-1/2” gated tank drain shall be installed. It shall be controlled by a manually operated Akron 1-1/2” valve at the left side running board area or under L1 compartment with a running board suction tray, slide-out platform, or a heat pan and shall be controlled at the valve and visually indicate the position of the valve at all times. |  |  |  |
| The valve shall be an Akron 8800HD series with a chrome plated brass ball for ease of operation and increased abrasion resistance. The valve shall have a self-locking ball feature using an automatic friction lock design to balance the brass ball when in a throttle position with water flowing through it. |  |  |  |
| The valve shall be of the unique Akron swing-out design to allow the valve body to be removed for servicing without disassembling the plumbing. |  |  |  |
| All fabricated piping shall be a minimum of Schedule 10 stainless steel for superior corrosion resistance and decreased friction loss. |  |  |  |
| The tank drain shall be mounted inside de pump module protected from freezing |  |  |  |
| Technical specifications | Conform  Yes No | | Comments |
| 1. **WATER TANK MOUNTING SYSTEM:**   The water tank shall be mounted on an extruded aluminum framework. The booster tank mounting system shall utilize a floating design to reduce stress from road travel and vibration. |  |  |  |
| To maintain a low vehicle center of gravity, the water tank bottom shall be mounted within 5” of the frame rail top. Designs that store ground ladders under the water tank and raise the center of gravity of the vehicle shall not be acceptable. |  |  |  |
| The body design shall allow the booster tank to be completely removable without disturbing or dismounting the apparatus body structure. An extruded aluminum cradle covered with rubber shock pads and corner braces shall support the tank. |  |  |  |
| Technical specifications | Conform  Yes No | | Comments |
| 1. **WATER TANK WARRANTY:**   **UNITED PLASTIC FABRICATION INC. Warrants each UPF POLY-TANK IIE** Booster/Foam tank to be free from manufacturing defects in material and workmanship for the service life of the vehicle (vehicle must be actively used in fire suppression). **The UPF POLY-TANK IIE** must be installed in accordance with the United Plastic Fabricating installation manual. Every **UPF POLY-TANK IIE** is thoroughly inspected and tested for leaks before leaving our facility. Should any problems develop with your UPF **POLY-TANK IIE** booster/foam tank and will not meet performance criteria during the service life of the vehicle, notify UPF in writing or call our **TOLL-FREE SERVICE HOT LINE 1-800-USA-POLY.** Provide UPF with the serial number and a description of the problem. If the tank problem would render the truck out of service, UPF will dispatch a service technician WITHIN 48 HOURS (2 DAYS) to repair the tank. (This time period is for North America only). If the vehicle can remain in service, UPF will dispatch a service technician within a mutually agreed upon time period. |  |  |  |
| We will repair, or at our option, replace the tank with a **new UPF POLY-Tank IIE. UPF** will cover customary and reasonable costs to remove and install the UPF POLY-TANK IIE. This warranty will not cover tanks that have been improperly installed, misused or abused, and the serial number must not have, been altered, defaced or removed. UPF will not cover any unauthorized third party repairs or alterations. Any of these actions may void the warranty. |  |  |  |
| **THERE ARE NO WARRANTIES, EXPRESSED OR IMPLIED, WHICH EXTEND BEYOND THE DESCRIPTION OF THE FACE HEREOF. THERE IS NO EXPRESS OR IMPLIED WARRANTY OF MERCHANTABILITY OR A WARRANTY OF FITNESS FOR A PARTICULAR PURPOSE. ADDITIONALLY, THIS WARRANTY IS IN LIEU OF ALL OTHER OBLIGATIONS OR LIABILITIES ON THE PART OF UNITED PLASTIC FABRICATION, INC.** |  |  |  |
| This warranty contains the entire warranty. It is the sole warranty and price agreements or representation, whether oral or written, are either merged herein or expressly cancelled. **UNITED PLASTIC FABRICATION, INC.** Neither assumes, nor authorizes any person supposing to act on its behalf, to change, nor assume for it, any warranty or liability concerning its product. |  |  |  |
| **IN NO EVENT WILL UNITED PLASTIC FABRICATION, INC BE LIABLE FOR AN AMOUNT IN EXCESS OF THE PRESENT RETAIL, PURCHASE PRICE PLUS INSTALLATION AND REMOVAL COST OF THE BOOSTER TANK, FOR ANY LOSS OR DAMAGE, WHETHER DIRECT OR** **INDIRECT, INCIDENTAL, CONSEQUENTIAL, OR OTHERWISE ARISING OUT OF FAILURE OF ITS PRODUCT.** |  |  |  |
| This warranty gives you specific legal rights, and you may have other rights, which vary from state to state. Some states do not allow exclusion or limitation of incidental of incidental or consequential damage, so the above limitation or exclusion may not apply to you. Some states do not allow limitation on how long an implied warranty lasts, so the above limitation may not apply to you. |  |  |  |
| Technical specifications | Conform  Yes No | | Comments |
| 1. **HOSEBED CONSTRUCTION:**   A single, continuous hosebed with no chutes shall be supplied on the right-hand side of the body. The hosebed shall contain 48 cubic feet of useable space for the storage of hose. The hosebed shall measure 26” high x 23” wide x 140” long (fore-aft) to allow the use of large-diameter supply hose with a minimum number of hose folds. Shorter hosebeds shall not be acceptable as shorter hosebeds are harder to load due to the increased number of folds and dutchman. |  |  |  |
| The hosebed compartment deck shall be constructed entirely from maintenance-free, extruded aluminum slats. The slats shall have an anodized rounded ribbed top surface. The slats shall be of alternating widths -- one (1) approximately 3/4” (0.75”) high x 7.5” wide and the other approximately 3/4” (0.75”) high x 2.75” wide -- and shall be riveted into a one-piece grid system to prevent the accumulation of water and allow ventilation to assist in drying hose. The hosebed compartment shall be free of sharp edges and projections to prevent hose damage. The compartment deck design shall incorporate a provision for the installation of adjustable hosebed dividers. |  |  |  |
| The hosebed sides shall consist of 3/16” (0.188”) 3003 H14 smooth aluminum plate welded to a perimeter frame constructed of 3” x 3” x 3/16” (3” x 3” x 0.188”) heavy-walled 6063-T5 aluminum extrusions for rigidity. |  |  |  |
| A hose bed approximately 26" deep x 23" wide x 140" long shall be provided. The hose bed shall hold up to 800` of 5" LDH and 300-400` of 2.5" or 3" DJ hose. Hose bed capacity shall be decreased if the optional diamond plate hose bed covers are selected. |  |  |  |
| Technical specifications | Conform  Yes No | | Comments |
| 1. **HOSEBED COVERS:**   **Rear Hose Bed Cover**  A cover constructed of Black 18 oz. PVC vinyl coated polyester shall be installed at the rear apparatus hose bed. The base fabric shall be 1000 x 1300 Denier Polyester with a fabric count of 20 x 20 per square inch.  The top of the cover shall be mechanically attached to the rear hose bed cover extrusion. The lower portion of the cover shall be secured in place with heavy duty nylon straps to comply with the latest edition of NFPA 1901. |  |  |  |
| **Cover Hose Bed-Aluminum**  An aluminum cover shall be provided to protect fire hose stored in the hose bed.  The hose bed cover shall be constructed of 1/8” aluminum tread with Linex package and shall be one (1) piece in design. The cover shall be hinged with a full-length stainless steel knuckle hinge. For ease of use a pneumatic cylinder (gas shock) shall be used at the front of the cover. Recessed handles shall be provided at the front and rear of the cover. |  |  |  |
| The cover shall have a single water and corrosion resistant switch that will activate the red flashing door ajar light in the cab to alert the driver that the cover is open. |  |  |  |
| **Crosslay Cover**  A crosslay cover shall be provided for the crosslay storage area of the pump module. The crosslay cover shall be provided in compliance with NFPA. |  |  |  |
| The crosslay cover shall be constructed from a minimum .125” aluminum treadplate. The crosslay cover shall include two (2) full-length stainless steel (0.25”) rod piano-type hinges. The cover shall be hinged to open and not interfere with applicable plumbing components on the apparatus. |  |  |  |
| The two (2) hinges shall provide a bi-fold application that shall allow an area of the crosslay to be accessible without completely opening the cover. |  |  |  |
| The crosslay cover shall include applicable grab handles and two (2) hold downs to secure the cover in the closed position. |  |  |  |
| Crosslay Cover Hinge  The crosslay cover shall be hinged along the forward edge of the crosslay area. |  |  |  |
| **Cover – Sides**  A pair of covers constructed of Black 18 oz. PVC vinyl coated polyester shall be installed over the side openings of the apparatus crosslay. The base fabric shall be 1000 x 1300 Denier Polyester with a fabric count of 20 x 20 square inch. |  |  |  |
| The covers shall be secured in place to comply with the latest edition of NFPA 1901. |  |  |  |
| Crosslay Cover  A cover constructed of black 18 oz. PVC vinyl coated polyester shall be installed on the service access opening at the front of the pump compartment. The base fabric shall be 1000 x 1300 Denier Polyester with a fabric count of 20 x 20 square inch. |  |  |  |
| The cover shall be held in place by twist-Lock fasteners in the corners and snaps on the sides. |  |  |  |
| Technical specifications | Conform  Yes No | | Comments |
| 1. **HOSE BED DIVIDER:**   There shall be a hose bed divider provided the full fore-aft length of the hose bed.  The hose bed divider shall be constructed of 1/4” (0.25”) smooth aluminum plate with an extruded aluminum base welded to the bottom. The rear end of the divider shall have a 3” radius corner to protect personnel. The divider shall be natural finish aluminum for long-lasting appearance and shall be sanded and de-burred to prevent damage to the hose.  The divider shall be adjustable from side to side in the hose bed to accommodate varying hose loads. |  |  |  |
| **Hose Bed Divider Hand Hold**  There shall be a hand hole cut-out(s) on the trailing edge of each hose bed divider. The cut-out(s) is specifically sized for use in adjusting of the hose bed divider. |  |  |  |
| Technical specifications | Conform  Yes No | | Comments |
| 1. **AERIAL BODY:**   The apparatus body shall include a single, pumper-sized hosebed with a minimum volume of 48 cubic feet of useable space and a minimum length (fore-aft) of 140” for the storage of hose. Split hosebeds which require making and/or breaking hose connections to deploy and/or reload the full hose load are not acceptable because the extra time required to perform these operations would be detrimental to the efficient performance of the apparatus. Hosebeds which are less than 140” in length are not acceptable because the extra number of hose folds involved to load the hose would take extra space and require extra effort. |  |  |  |
| The hosebed shall be designed to permit the deployment of hose from the rearmost portion of the body while the vehicle is in motion without raising the aerial ladder from its stored position. Hosebeds which deploy hose from a position partway along the side of the body are not acceptable because of the possibility of snagging the hose or a hose coupling on the aerial ladder turntable or on a protruding portion of the body. |  |  |  |
| The hosebed shall be designed to allow manual reloading of the hose from the rear, top, and side without raising the aerial ladder from its stored position. These requirements are deemed essential to the effective operation of the apparatus when pumper operations are required. **NO EXCEPTIONS**. |  |  |  |
| The body design shall have a rescue-style configuration with 26” deep lower compartments and 23/24” deep upper compartments that provide a total of 172.15 cu. ft. of storage. The cubic footage shall not include ladder tunnels or the hosebed.  The minimum water tank size to be considered acceptable shall be 500 gallons to support pumper operations. |  |  |  |
| The body design shall be modular to permit easy repair and remounting. An extruded aluminum body is required to provide a strong, lightweight, corrosion-resistant vehicle. |  |  |  |
| Technical specifications | Conform  Yes No | | Comments |
| 1. **BODY CONSTRUCTION:**   The apparatus body shall be constructed entirely of aluminum extrusions with interlocking aluminum plates. A modular aluminum body is required due to the high strength-to-weight ratio of aluminum, its corrosion resistance, its ease of repair, and its light weight for increased equipment carrying capacity. |  |  |  |
| The interlocking body framework shall be constructed from beveled 6061-T6 and 6063-T5 extrusions electrically seam welded both internally and externally at each joint using 5356 aluminum alloy welding wire. |  |  |  |
| All horizontal surfaces, running boards, rear step, and the vertical rear body surface shall be constructed from aluminum diamond plate. |  |  |  |
| Technical specifications | Conform  Yes No | | Comments |
| 1. **BODY SUBSTRUCTURE:**   The body substructure shall be constructed of aluminum extrusions. Body designs that incorporate steel substructures connected to aluminum compartments are not as corrosion- resistant and are not acceptable. |  |  |  |
| Body substructure crossmember extrusions shall be at the front of the body and ahead of the rear wheel well. |  |  |  |
| The extrusions shall be 3” x 3” 6061-T6 aluminum with 3/8” (0.375”) wall thickness. A solid 3” x 3”” I-beam” section aluminum extrusion shall be provided the full width of the body over the rear wheel well. |  |  |  |
| The crossmembers shall be designed to support the compartment framing and shall be welded to 1-3/16” x 3” (1.188” x 3”) solid 6063-T5 aluminum frame sill extrusions. |  |  |  |
| The frame sill extrusions shall be shaped to contour with the chassis frame rails and shall be protected from contact with the chassis frame rails by 5/16” x 2” (0.31” x 2”) fiber-reinforced rubber strips to prevent wear and galvanic corrosion caused when two dissimilar metals come in contact. |  |  |  |
| Technical specifications | Conform  Yes No | | Comments |
| 1. **BODY MOUNTING SYSTEM:**   The body shall be attached to the chassis frame rails with a series of 5/8” (0.625”) diameter steel U-bolts. |  |  |  |
| The U-Bolt system shall be used to allow easy removal of the body for major repair or disassembly. Body designs that weld the body to the aerial torque box or to the chassis frame rails are not acceptable because of the stress imposed on the vehicle during road travel and aerial operations. |  |  |  |
| Technical specifications | Conform  Yes No | | Comments |
| 1. **REAR BODY DESIGN:**   The rear body shall be designed to provide ground ladder storage, hose deployment, and service access to aerial components. A horizontally-hinged door in the center of the rear body shall provide access to the lower turntable. |  |  |  |
| An access door on each side of the service door shall provide storage for ladders and pike poles. The area under the hosebed shall provide additional storage for ground ladders. The ground ladder storage locations on the rear body shall be supplied with doors. All rear access doors shall match the rear body finish. |  |  |  |
| Technical specifications | Conform  Yes No | | Comments |
| 1. **BODY TOP:**   Removable embossed diamond plate around the aerial turntable shall be supplied for top service access to check the aerial hydraulic oil level, and remove the oil tank if needed. |  |  |  |
| Technical specifications | Conform  Yes No | | Comments |
| 1. **FUEL FILL LOCATION:**   The fuel fill position shall be located at the rear of the apparatus next to the waterway inlet. The fuel tank filler neck shall be located behind a hinged door that is labeled” Diesel Fuel Only.” |  |  |  |
| Technical specifications | Conform  Yes No | | Comments |
| 1. **STABILIZER OPENINGS:**   Directly behind the rear wheel well opening on each side shall be body openings for aerial stabilizers. The openings shall be framed in aluminum extrusions and fitted with removable panels for service access to the backside of the stabilizer extension rods. |  |  |  |
| Technical specifications | Conform  Yes No | | Comments |
| 1. **SIDE AERIAL ACCESS STAIRCASE:**   A single access staircase to the aerial ladder turntable shall be supplied on the driver`s side of the apparatus. The staircase shall incorporate a pocket-style drop-down step in the body to reduce the ground-to-staircase step height when the unit is supported on the stabilizers. |  |  |  |
| The angled staircase shall be supplied with extruded aluminum handrails on both sides of the staircase frame. |  |  |  |
| Access steps shall be mounted in accordance with current NFPA requirements and shall not exceed a maximum stepping height of 18”. The top surface of the step shall have a minimum of 35 sq. in. and shall have an aggressive multi-directional, slip-resistant surface. Access steps shall be able to support up to 500 lbs. Steps shall be located to provide a minimum of 8” clearance between the leading edge of the step and any obstruction.  A Linez package shall be supplied for the access ladder and ladder well. |  |  |  |
| Technical specifications | Conform  Yes No | | Comments |
| 1. **SINGLE AXLE WHEEL WELL LINER:**   The body wheel well frame shall be constructed from 6063-T5 aluminum extrusion with a slot the full length to permit an internal fit of 1/8” (0.125”) aluminum treadplate. The wheel well trim shall be constructed from 6063-T5 formed aluminum extrusion. |  |  |  |
| The fenderettes shall be bolt-on and shall be easily removable. The fenderette shall be constructed from .080" aluminum with a mirror finish. The fenderette shall be 2 1/2" (2.5") wide x 2 1/4" (2.25") tall with a 26 7/8" (26.875") radius. A "P" shaped rubber gasket shall be provided between the fenderette and wheel well body panel. |  |  |  |
| The wheel well liners shall be constructed of a 3/16” (.187”) composite material. The liners shall be bolt-on and shall provide a maintenance-free and damage-resistant  Surface |  |  |  |
| Technical specifications | Conform  Yes No | | Comments |
| 1. **SCBA BOTTLE STORAGE:**   The body wheel well area shall store up to four (4) SCBA bottles- two (2) on the officer side and two (2) on the driver side. The bottles shall be secured in each storage area by a vertical hinged door which shall be secured in the closed position by a push button latch. |  |  |  |
| The doors shall have a peinted finish. |  |  |  |
| Each storage area shall provide individual storage of a bottle and shall not allow forward or rearward movement of the bottle. The bottle(s) shall be removable from the storage area without the bottle(s) coming into contact with any surface area of the wheel **well (NO EXCEPTIONS).** |  |  |  |
| **SCBA Strap**  Straps shall be provided in each exterior storage compartment to provide secondary means to hold each SCBA bottle in the compartment. The straps shall be constructed from 1" nylon webbing formed in a loop. The strap(s) shall be mounted to the storage compartment ceiling directly inside the door opening at each bottle location. |  |  |  |
| Technical specifications | Conform  Yes No | | Comments |
| 1. **FENDERETTES:**   The rear wheel wells shall be radius cut for a streamlined appearance. A rubber fenderette shall be furnished at each rear wheel well opening, held in place with concealed stainless steel fasteners. |  |  |  |
| Technical specifications | Conform  Yes No | | Comments |
| 1. **BODY DOOR CONSTRUCTION:**   **Single Compartment Door**  A single compartment door shall be constructed using a box pan configuration. The outer door pan shall be beveled and shall be constructed from 3/16” (0.188”) aluminum plate. The inner door pan shall be constructed from 3/32" (0.090”) smooth aluminum plate and shall have nutsert fittings to attach hold-open hardware. The inner pan shall have a 95-degree bend to form an integral drip rail. |  |  |  |
| The compartment door shall have a 1” x 9/16” (1” x 0.43”) closed-cell” P” EPDM sponge gasket meeting ASTM D-1066 2A4 standards installed around the perimeter of the door to provide a seal that is resistant to oil, sunlight, and ozone. |  |  |  |
| A drain hole shall be installed in the lower corner of the inside door pan to assist with drainage. |  |  |  |
| A polished stainless steel Hansen D-ring style twist-lock door handle a with #459 latch shall be provided on the door. The 4-1/2” (4.5”) D-ring handle shall be mounted directly to the door latching mechanism with screws that do not penetrate the door material for improved corrosion resistance. |  |  |  |
| The compartment door shall be securely attached to the apparatus body with a full-length stainless steel 1/4” (0.25”) rod piano-type hinge isolated from the body and compartment door with a dielectric barrier. The door shall be attached with machine screws threaded into the doorframe. The door shall have gas shock-style hold-open devices. |  |  |  |
| An anodized aluminum drip rail shall be mounted over the compartment opening to assist in directing water runoff away from the compartment.  The door(s) shall be installed in the following location(s): L2, L3 |  |  |  |
| **Roll Up Compartment Door**  A ROM brand roll up door with job painted finish shall be provided on a compartment greater than 45” tall. The door(s) shall be installed in the following location(s): L1, L4, R1. |  |  |  |
| The Robinson door slats shall be double wall box frame and manufactured from anodized aluminum. The slats shall have interlocking end shoes on each slat. The slats shall have interlocking joints with a PVC/vinyl inner seal to prevent any metal to metal contact and inhibit moisture and dust penetration. |  |  |  |
| The track shall be anodized aluminum with a finishing flange incorporated to provide a finished look around the perimeter of the door without additional trim or caulking. |  |  |  |
| The track shall have a replaceable side seal to prevent water and dust from entering the compartment. |  |  |  |
| The doors shall be counterbalanced for ease in operation. A full width latch bar shall be operable with one hand, even with heavy gloves. Securing method shall be a positive latch device. |  |  |  |
| A magnetic type switch integral to the door shall be supplied for door ajar indication and compartment light activation.  The door opening shall be reduced by 2” in width and approximately 8-9” in height depending on door height. |  |  |  |
| **Drip Pan**  A ROM drip pan shall be supplied for each roll-up door. The drip pan shall be made from a high strength aluminum alloy. The splashguard and end caps shall be made from extruded and injection molded high-impact plastic. Drip pan location(s): L1, L4, R1. |  |  |  |
| **Double Compartment Door**  Double compartment doors shall be constructed using a box pan configuration. The outer door pans shall be beveled and shall be constructed from 3/16” (0.188”) aluminum plate. The inner door pans shall be constructed from 3/32" (0.090”) smooth aluminum plate and shall have nutsert fittings to attach hold-open hardware. The inner pans shall have a 95-degree bend to form an integral drip rail |  |  |  |
| The compartment doors shall have a 1” x 9/16” (1” x 0.43”) closed-cell” P” EPDM sponge gasket meeting ASTM D-1066 2A4 standards installed around the perimeter of the doors to provide a seal that is resistant to oil, sunlight, and ozone. |  |  |  |
| A drain hole shall be installed in the lower corner of the inside door pan to assist with drainage. |  |  |  |
| A polished stainless steel Hansen D-ring style twist-lock door handle a with #459 latch shall be provided on the primary door. The 4-1/2” (4.5”) D-ring handle shall be mounted directly to the door latching mechanism with screws that do not penetrate the door material for improved corrosion resistance. |  |  |  |
| The secondary door shall have a dual stage rotary latch with a 750-lb rating to hold the door in the closed position. The latch shall be mounted at the top of the door. A stainless-steel paddle style handle shall be mounted on the interior pan of the door to actuate the rotary latch. The paddle handle shall be connected to the rotary latch by a 5/32" (.156") diameter rod. Cable actuation shall be deemed un-acceptable due to the potential for cable stretch and slippage. The striker pin shall be 3/8" (.38") diameter with slotted mounting holes for adjustment. |  |  |  |
| Double door latch to have latch brackets fabricated from .125 aluminum smooth plate, installed with "PULL" tags #1032993 for left side and #1032294 for right side.  The compartment doors shall be securely attached to the apparatus body with a full-length stainless steel 1/4” (0.25”) rod piano-type hinge isolated from the body and compartment doors with a dielectric barrier. The doors shall be attached with machine screws threaded into the doorframe. |  |  |  |
| The doors shall have a gas shock-style hold-open device. The gas shocks shall have a 30-lb rating and be mounted near the top of the door (when possible). |  |  |  |
| An anodized aluminum drip rail shall be mounted over the compartment opening to assist in directing water runoff away from the compartment. |  |  |  |
| The door(s) shall be installed in the following location(s): R2 |  |  |  |
| Technical specifications | Conform  Yes No | | Comments |
| 1. **COMPARTMENT CONSTRUCTION:**   All compartment walls and ceilings shall be constructed from 1/8” (0.125”) formed aluminum 3003 H14 alloy plate. |  |  |  |
| Each compartment shall be modular in design and shall not be part of the body support structure. |  |  |  |
| Compartment floors shall be constructed of 3/16” (0.187”) aluminum diamond plate welded in place. Compartment floors shall be supported by either 1.5” x 3” x 1/8” (0.125”) walled aluminum extrusions or .5” x 3” aluminum flatbar. The compartment seams shall be sealed using a permanent pliable silicone caulk |  |  |  |
| The walls of each compartment shall be machine-louvered for adequate ventilation. External compartment tops shall be constructed of 1/8” (0.125”) embossed aluminum diamond plate. Service access shall be provided to the main body wiring harnesses.  The compartment interior walls and ceiling shall be natural finish aluminum to provide a long-lasting, maintenance-free surface. |  |  |  |
| Technical specifications | Conform  Yes No | | Comments |
| 1. **LADDER STORAGE / RACKS:**   Two (2) ground ladder storage areas shall be provided at the rear of the apparatus. The storage areas shall be located one (1) each side of the aerial pedestal. The storage areas shall be vertical in design to allow the ladders to be stored on edge. Combined with a body or aerial mounted 14` or greater ladder, they shall provide storage for up to 115` of ground ladders in order to exceed the requirements of the current edition of NFPA 1901 for both aerial ladders and quints. |  |  |  |
| The vertical compartment under the left-hand side of the aerial ladder turntable shall be approximately 8.75” wide x 26.5” high x 205” deep and shall be accessible through a door at the rear of the apparatus. The bottom of this compartment shall be no more than 55” above the ground with the vehicle in the unloaded condition to allow easy removal of the ladders. |  |  |  |
| The vertical compartment under the right-hand side of the aerial ladder turntable shall be approximately 8.375” wide x 23.375” high x 205” deep and shall be accessible through a door at the rear of the apparatus. The bottom of this compartment shall be no more than 55” above the ground with the vehicle in the unloaded condition to allow easy removal of the ladders. |  |  |  |
| The ladders in the compartments shall be held captive top and bottom by aluminum tracks and shall slide on friction-reducing material. All ladders shall be removable individually without having to remove any other ladder.  The ladder rack shall hold: PEL3-35, PEL-28 and PRL-16. |  |  |  |
| Technical specifications | Conform  Yes No | | Comments |
| 1. **STEPS, STANDING, AND WALKING SURFACES:**   The maximum stepping distance shall not exceed 18”, with the exception of the ground-to-first step distance, which shall not exceed 24”. The maximum ground-to-first step distance shall be maintained when the stabilizers are deployed by the use of an auxiliary set of steps installed at the aerial access staircase. All steps or ladders shall sustain a minimum static load of 500 lbs. without deformation as outlined in the current edition of NFPA 1901. |  |  |  |
| All exterior steps shall be designed with a minimum slip resistance of 0.52 when tested wet using the Brungraber Mark II tester in accordance with the manufacturer's instructions.  All steps shall include a Linex package. |  |  |  |
| Technical specifications | Conform  Yes No | | Comments |
| 1. **HANDRAILS:**   Access handrails shall be provided at all step positions, including, but not limited to, the rear tailboard. |  |  |  |
| All body handrails shall be constructed of maintenance-free, corrosion-resistant extruded aluminum. Handrails shall be a minimum of 1.25” diameter and shall be installed between chrome end stanchions at least 2” from the mounting surface to allow for access with a gloved hand. |  |  |  |
| The extruded aluminum shall be ribbed to assure a good grip for personnel safety.  The handrails shall be installed as follows:   * Two (2) 48” handrails, one (1) on each side of the aerial access stair case |  |  |  |
| The hand rails shall have intergraded LED lighting. |  |  |  |
| Technical specifications | Conform  Yes No | | Comments |
| 1. **BODY PROTECTION PANELS:**   Aluminum tread plate overlays and panels shall be installed on the front of the body compartment from the lower edge to the top of the compartment doors.  It shall include a black Linex package. |  |  |  |
| The rear body panels of the body shall be a smooth material, to allow for the proper application and installation of a "Chevron" stripe on the rear. |  |  |  |
| Technical specifications | Conform  Yes No | | Comments |
| 1. **POLISHED WELDS:**   The body welds shall be polished. |  |  |  |
| Technical specifications | Conform  Yes No | | Comments |
| 1. **EXTRUDED ALUMINUM RUB RAILS:**   The body shall have a rubrail along the length of the body on each side and at the rear. |  |  |  |
| The rubrail shall be constructed of minimum 3/16” (0.188”) thick anodized aluminum 6463-T6 extrusion. The rubrail shall be a minimum of 2.75” high x 1.25” deep and shall extend beyond the body width to protect compartment doors and the body side.  They shall be black in colour. |  |  |  |
| The rubrail shall be of a C-channel design to allow marker and warning lights to be recessed inside for protection. The top surface of the rubrail shall have a minimum of five (5) serrations raised 0.1” high with cross grooves to provide a slip-resistant edge for the rear step and running boards. |  |  |  |
| The rubrail shall be spaced away from the body using 3/16” (0.188”) nylon spacers to prevent the accumulation of dirt, road salt, and other corrosive materials. The ends of each rubrail section shall be provided with a rounded corner piece. The vertical surface inside the rubrail C-channel shall be inset with a reflective material for increased side and rear visibility. |  |  |  |
| Technical specifications | Conform  Yes No | | Comments |
| 1. **REAR BODY PANELS:**   The rear body panels shall be smooth 1/8” un-painted aluminum plate to facilitate rear body striping. The panels shall be bolt-on for a clean appearance and easier repair in the event of damage. |  |  |  |
| Technical specifications | Conform  Yes No | | Comments |
| 1. **AERIAL BODY OPTIONS:**   A dunnage pan constructed of 3/16” (.188”) aluminum treadplate shall be located rearward of the crosslays. The dunnage pan shall be sized to maximize available storage space. |  |  |  |
| Two (2) piece outrigger covers constructed of .125`` aluminum tread plate shall be provided for the jack leg openings. One piece of the cover shall be sized to cover just the extending outrigger in order to require a minimal amount of set-up space. The second piece of the cover shall be fixed and mounted to the body to cover the remaining outrigger opening. |  |  |  |
| The driver/officer jack and master control switch panels at the rear of the body shall be provided with access doors. The doors shall have the same finish as the rear of the body. |  |  |  |
| Technical specifications | Conform  Yes No | | Comments |
| 1. **REAR PIKE POLE/ATTIC LADDER STORAGE:**   A storage compartment shall be provided at the rear of the body for six (6) pike poles and one (1) attic ladder with feet. The storage area shall be labeled for two (2) 6` poles, two (2) 8` poles, two (2) 10` poles and one (1) 10` attic ladder. The pike poles and attic ladder shall be secured by a hinged aluminum plate door that matches the rear body finish. |  |  |  |
| Technical specifications | Conform  Yes No | | Comments |
| 1. **AUXILIARY GROUND PADS:**   Two (2) auxiliary ground pads shall be provided. The pads shall be 24” x 24” x 1/2” thick aluminum plate with a 20-degree formed handle with cut-outs for hand hold. The pads shall be stored in brackets that are welded below the body. |  |  |  |
| Technical specifications | Conform  Yes No | | Comments |
| 1. **ARIAL LADDER:**   **Performance**  A 75`-telescopic aerial ladder of the open-truss design shall be installed at the rear of the vehicle with the aerial ladder pointed forward when it is in the travel position. |  |  |  |
| The aerial ladder shall meet or exceed the requirements of the current edition of NFPA 1901, Sections 19.2 through 19.6 and Sections 19.17 through 19.25. |  |  |  |
| The aerial ladder shall consist of three (3) telescopic ladder sections capable of operating from minus (-) 8 degrees to plus (+) 76 degrees’ elevation at any ladder extension to give a full range of movement |  |  |  |
| The aerial ladder shall be designed to provide continuous egress for firefighters and civilians from any angle of elevation to the ground as defined in the current edition of NFPA 1901. |  |  |  |
| The aerial ladder shall have a rated vertical height of 75` measured in a vertical plane from the outermost rung of the outermost fly section to the ground with the ladder at maximum elevation and extension as defined in the current edition of NFPA 1901. |  |  |  |
| The aerial ladder shall have a rated horizontal reach of 68` measured in a horizontal plane from the centerline of the turntable rotation to the outermost rung of the outermost fly section with the aerial ladder extended to its maximum horizontal reach as defined in the current edition of NFPA 1901. |  |  |  |
| The aerial ladder shall utilize a single pair of stabilizers - one (1) on the left and one (1) on the right opposite each other - with a maximum horizontal stabilizer spread of 16` across the centerlines of the footpads. Aerial ladders which require two (2) sets of extending stabilizers or that have a maximum stabilizer spread greater than 16` are not acceptable because of the need to utilize the aerial ladder in confined areas. |  |  |  |
| The aerial ladder shall have a rated tip capacity of 550 lbs. when the ladder is unsupported at full extension and 0 degrees’ elevation as defined by the current edition of NFPA 1901.  This capacity may take the form of firefighters wearing personal protective gear, people being rescued, equipment, or any combination of loads not to exceed the rated tip capacity. The rated tip capacity shall include to an allowance of 50 lbs. for equipment mounted at the tip of the ladder. |  |  |  |
| Ladders which have a rated NFPA tip capacity of less than 550 lbs. are not acceptable because of the need to utilize the aerial ladder for rescue operations in which two (2) personnel may be on the tip at the same time. **NO EXCEPTIONS**. |  |  |  |
| The ladder shall be able to provide full operating capacities in up to 35 mph wind conditions. |  |  |  |
| **Aerial Ladder Construction**  To ensure a high strength-to-weight ratio, high heat resistance, and an inherent corrosion resistance, the aerial ladder shall be constructed entirely of extruded high-strength aluminum alloy. **NO EXCEPTIONS.** |  |  |  |
| All side rails, rungs, handrails, uprights and K-braces shall be made of structural 6061-T6 aluminum alloy extrusions. All material shall be tested and certified by the material supplier. All ladder sections shall be semi-automatically welded by inert gas shielded-arc welding methods using 5356 aluminum alloy welding wire. Structural rivets or bolts shall not be utilized in the ladder weldment sections.  Due to the unpredictable nature of fireground operations, a minimum safety factor of 2.5 to 1 is desired. |  |  |  |
| This structural safety factor shall apply to all structural aerial components including turntable and torque box stabilizer components. Definition of the structural safety factor shall be as outlined in **NFPA 1901 A.19.20.1: NO EXCEPTIONS** |  |  |  |
| DL = Dead load stress. Stress produced by the weight of the aerial device and all permanently attached components. |  |  |  |
| RL = Rated capacity stress. Stress produced by the rated capacity load of the ladder. |  |  |  |
| WL= Water load stress. Stress produced by nozzle reaction force and the weight of water in the water delivery system. |  |  |  |
| FY = Material yield strength. The stress at which material exhibits permanent deformation.  2.5 x DL + 2.5 x RL + 2 x WL equal to/less than FY |  |  |  |
| The minimum NFPA specification is exceeded in this paragraph by requiring safety margin above 2 to 1 while flowing water. |  |  |  |
| The stability factor or tip over safety margin shall be a minimum of 1.5 to 1 as defined by NFPA 1901 19.21. |  |  |  |
| An independent, third-party engineering firm shall verify both the structural safety factor and the stability factor. Design verification shall include computer modeling and analysis, and extensive strain gauge testing performed by an independent registered professional engineer. Written certification from the independent, third-party engineering firm shall be made available by the manufacturer upon request from the purchaser**. NO EXCEPTIONS** |  |  |  |
| All welding of aerial components -- including the aerial ladder sections, turntable, torque box, and outriggers -- shall be performed by welders who are certified to American Welding Society Standards D1.1, D1.2 and D1.3 as outlined in the current edition of **NFPA 1901. NO EXCEPTIONS.** |  |  |  |
| The weldment assemblies of each production unit shall be tested visually and mechanically by an ASNT-certified level II non-destructive test technician to comply with the current edition of NFPA 1901. Testing procedures shall conform to the American Welding Society Standard B1.10 Guide for non-destructive testing. Test methods include a thorough visual inspection of each weld and the use of dye penetrates where applicable. |  |  |  |
| Each ladder section shall consist of two (2) extruded aluminum side rails and a combination of aluminum rungs, tubular diagonals, verticals, and two (2) full-length handrails. The rungs on all sections shall be K-braced for maximum lateral stability. This K-bracing shall extend to the center of each rung to minimize ladder side deflection. |  |  |  |
| The ladder rungs shall be spaced on 14” centers and shall be designed with an integral skid-resistant surface to eliminate the need for rubber rung covers. A” D” shaped rung shall be utilized to provide a larger step surface at low angles and a more comfortable grip at elevated positions. |  |  |  |
| The larger step surface is critical to distribute the load on the bottom of the firefighters` foot. Round rungs are not acceptable as they increase the stress load on the foot and are more likely to cause bruising. The minimum design load of each rung shall be 500 lbs. distributed over a 3-1/2” (3.5”)-wide area in the center of the length of the rung as required in the current edition of **NFPA 1901. NO EXCEPTIONS.** |  |  |  |
| To provide a wide working area with an easy-to-grasp handrail, the aerial ladder shall exceed the requirements of the current edition of NFPA 1901 regarding the minimum ladder section inside width and the minimum handrail height by providing the following inside widths and handrail heights: |  |  |  |
| A fly section width of at least 25” is required to allow a 24” wide stokes basket to fit between the handrails.   * Section Width Height * Base Section 37-5/8” 22-7/8” * Second Section 30-3/4” 19-3/8” * Fly Section 25-3/16” 16-1/4” |  |  |  |
| **Ladder Extension/Retraction Mechanism**  Both power extension and power retraction shall be furnished and shall meet the requirements of the current edition of NFPA 1901. |  |  |  |
| Extension and retraction shall be by way of two (2) hydraulic cylinders mounted on each side of the base section of the aerial ladder. Each cylinder shall have a 3-1/4” (3.25”) bore and a 59-1/2” (59.5”) stroke. |  |  |  |
| The cylinders shall operate through a block and tackle cable arrangement to extend and retract the ladder. Maximum extension of the ladder is to be automatically limited by the stroke of the cylinders. |  |  |  |
| The normal operating cable safety factor shall be 5.0 to 1 and the stall safety factor shall be 2.0 to 1 based on the breaking strength of the cables. The minimum ratio of the diameter of the block and tackle sheave to the diameter of the cable shall be 12.0 to 1 to allow smooth operation and reduce bending stresses on the cables. The cables shall be treated with Pre-Lube 6 for increased service life. |  |  |  |
| The cable sizes shall be as follows:   * 2nd section (4 cables - 2 extend, 2 retract) 7/16” 6 x 19 galvanized cable * Fly section (4 cables - 2 extend, 2 retract) 1/4” 7 x 19 galvanized cable |  |  |  |
| The aerial ladder sections shall slide within each other. Nylatron NSM pads shall be utilized between each section to minimize friction. Four (4) C-type interlocking load transfer stations shall enclose the pads.  The transfer stations shall be located at the upper portion of the base and the second ladder sections. |  |  |  |
| **Aerial Extension Indicator**  Reflective tape stripes shall be installed on the aerial ladder handrail of the base section to indicate extension in 10` increments. A reflective dot on the base of the second section shall provide a visual reference for the operator to estimate aerial elevation. |  |  |  |
| Aerial Finish  To reduce maintenance expense, the aerial ladder shall have a natural aluminum.  The tip of the aerial ladder shall be painted. It shall be a bright color.  This will also allow visible inspection of all ladder weld joints without having to remove paint or body filler to reveal the weld bead. |  |  |  |
| The aerial ladder shall complete the elevation-extension-rotation test described in the current edition of **NFPA 1901 in not more than 120 seconds or less. NO EXCEPTIONS.** |  |  |  |
| This test involves raising the aerial from the bedded position to full elevation and extension and rotating it 90 degrees. This test is to begin with the stabilizers deployed. |  |  |  |
| In addition to completing the test described above, the aerial ladder shall be capable of performing the following operations in the times noted:   * Time to extend ladder maximum 35 seconds * Time to retract ladder maximum 25 seconds * Time to raise ladder maximum 20 seconds * Time to lower ladder maximum 30 seconds * Time to rotate 180 degrees maximum 55 seconds |  |  |  |
| **Aerial Ladder Rated Capacities**  The aerial ladder shall have a rated capacity of 550 lbs. when the ladder is unsupported at full extension and 0 degrees’ elevation as defined by the current edition of NFPA 1901 |  |  |  |
| This rated capacity consists of a 500-lb personnel rating and a 50-lb. equipment rating. The 50-lb. capacity for the equipment is for mounted equipment at the tip. |  |  |  |
| This capacity may take the form of firefighters wearing personal protective gear, people being rescued, equipment, or any combination of loads not to exceed the rated tip capacity. The rated tip capacity shall be in addition to an allowance of 50 lbs. for equipment mounted at the tip of the ladder. |  |  |  |
| A sign mounted at the base of the aerial ladder shall communicate the aerial ladder capacity ratings for the following configurations when the ladder is in the unsupported, fully extended configuration while maintaining a 2.5 to 1 safety margin. |  |  |  |
| These capacities may take the form of firefighters wearing personal protective gear, people being rescued, equipment, or any combination of loads not to exceed the rated capacities. For purposes of this sign, it shall be assumed that each person weighs 250 lbs. In no case shall the actual combined weights of personnel, equipment, and other loads exceed the rated capacities. |  |  |  |
| The loads for each configuration are in addition to an allowance of 50 lbs. for equipment mounted at the tip of the ladder. |  |  |  |
| Condition #1- Tip load only, no water flowing  Elevation Capacity Pounds   * -8 to 40 degrees 2 people 500 lbs. * 41 to 49 degrees 3 people 750 lbs. * 50 to 76 degrees 4 people 1000 lbs |  |  |  |
| Condition #2- Distributed loads no water flowing (These include one person at the tip)  Elevation Capacity Pounds   * -8 to 30 degrees 3 people 750 lbs. * 31 to 45 degrees 5 people 1250 lbs. * 46 to 76 degrees 8 people 2000 lbs. |  |  |  |
| Condition #3- Ladder tip load while flowing 1000 gpm with pre-piped waterway  Elevation Capacity Pounds   * -8 to 76 degrees * 2 people 500 lbs. |  |  |  |
| **Hydraulic System**  Hydraulic power for all aerial ladder operations shall be supplied by the positive displacement power steering pump mounted on the vehicle engine to provide consistent pressure and rapid response. |  |  |  |
| The pump shall operate both the vehicle power steering system and the aerial ladder hydraulic system. It shall draw hydraulic fluid from a single reservoir, ensuring that the hydraulic fluid is circulated and warmed while the vehicle is responding to an incident, thus protecting the aerial ladder hydraulic system from extreme cold. |  |  |  |
| The system design shall allow the aerial hydraulic system to be engaged at any engine speed without damaging the system. |  |  |  |
| This is necessary to allow engagement of the aerial when pumping water at maximum capacity. The pump shall be able to supply 13 gpm of hydraulic fluid at a maximum pressure of 3,000 psi. |  |  |  |
| The hydraulic system shall normally operate between 1,000 and 2,500 psi. It shall have flow controls to protect hydraulic components and it shall incorporate a relief valve set at 2,800 psi to prevent over-pressurization. |  |  |  |
| The hydraulic fluid reservoir shall consist of a 52-gallon tank mounted to the torque box and plumbed to the suction side of the hydraulic pump. |  |  |  |
| The tank shall be supplied with a removable top to allow access to the tank strainer filter. There shall be ports for a return line and a tank drain on the reservoir. The reservoir fill cap shall be marked” Hydraulic Oil Only”. Gated valves under the tank shall facilitate filter changes. The hydraulic fluid reservoir shall have sufficient volume and be mounted in such a manner to minimize heat build up and meet the performance requirement in the current edition of **NFPA 1901.** |  |  |  |
| An interlock device shall be provided to prevent activation of the aerial ladder hydraulic pump until either the transmission is placed in neutral and the parking brake is set, or the transmission is placed in drive and the rear driveline is disengaged as outlined in **NFPA 19.17.**3. |  |  |  |
| All hydraulic components with non-sealing moving parts, whose failure could result in the movement of the aerial, shall have a minimum burst strength of four (4) times the maximum operating pressure to which the component is subjected in order to comply with the current edition of **NFPA 1901.** |  |  |  |
| All hydraulic components with dynamic sealing parts, whose failure could result in the movement of the aerial, shall not begin to extrude or otherwise fail at pressures at or below two (2) times the maximum operating pressure to which the component is subjected in order to comply with the current edition of **NFPA 1901.** |  |  |  |
| All hydraulic hoses and fittings shall have a minimum burst strength of at least three (3) times the maximum operating pressure to which the component is subjected in order to comply with the current edition of **NFPA 1901.** |  |  |  |
| All hydraulic tubing shall be made of stainless steel whenever possible. It shall have a minimum burst strength of four (4) times the maximum operating pressure to which it is subjected in order to exceed the requirements of the current edition of **NFPA 1901.** |  |  |  |
| Hydraulic systems composed primarily of hose or galvanized steel lines shall not be acceptable due to the higher maintenance requirements of the system over the life of the vehicle**. NO EXCEPTIONS** |  |  |  |
| A hydraulic oil pressure gauge and an aerial hour meter shall be supplied at the aerial ladder control station as required by the current edition **of NFPA 1901.** |  |  |  |
| The hydraulic system shall use 5w-20 multi-weight, SAE 32 grade oil. It shall incorporate the following filters in order to remove contaminants and provide dependable service:   * Reservoir Breather: 10-micron * Magnetic Reservoir Strainer: 125-mesh * Pressure Filter (Torque Box): 3-micron * Return Filter: 10-micron |  |  |  |
| The aerial ladder hydraulic system shall be designed in such a manner that a hydraulic pump failure or line rupture shall not allow the aerial or outriggers to lose position. Hydraulic holding valves shall be mounted directly on the hydraulic cylinders. |  |  |  |
| To ensure reliable performance of holding valves, hoses shall not be permitted between a holding valve and cylinder. **NO EXCEPTIONS.** |  |  |  |
| The aerial shall incorporate the use of stainless steel tubes inside the torque box and jack legs to minimize the possibility of hydraulic leaks.  Hydraulic power to the ladder shall be transferred from the torque box by a hydraulic swivel fitting. |  |  |  |
| Two (2) folding steps shall be located near the ladder tip to provide a position for a firefighter using the ladder pipe/monitor as outlined in the current edition of **NFPA 1901**. |  |  |  |
| The steps shall have a raised surface for traction and cut outs for easy manual deployment. Each step shall have a minimum load rating of 500 lbs. and shall have a minimum step area of 35 sq. in. |  |  |  |
| Technical specifications | Conform  Yes No | | Comments |
| 1. **FORWARD AERIAL SUPPORT:**   The aerial ladder support shall be constructed from 7/8" thick steel plate. Bolt-in diagonal bracing shall be installed on the support structure in an "X" pattern to restrict to side movement. This design shall allow for a pre-determined amount of flex preventing premature failure that can be found in an overly rigid structure. The support shall be located behind the rear wall of the cab and shall be bolted to the frame rails to allow removal in case of accidental damage. |  |  |  |
| Technical specifications | Conform  Yes No | | Comments |
| 1. **AERIAL TORQUE BOX:**   vertical cylindrical aerial torque box shall be used. Vehicles utilizing horizontal square aerial torque boxes are not acceptable because the heavy weight of these designs conflicts with the goal of utilizing a single rear axle. |  |  |  |
| The aerial torque box shall be welded from 10” x 28.5 lbs./ft. A36 grade structural steel channels with 3/8” (0.375”) thick top and bottom plates and 3/8” (0.375”) thick integral bulkheads. The pedestal shall be a 24” outside diameter cylinder with a 3/8” (0.375”) wall and shall connect the rotation bearing mounting plate to the torque box. |  |  |  |
| The aerial torque box pedestal assembly shall be bolted to the chassis frame with sixteen (16) 3/4” (0.75”) diameter Grade 8 bolts. It shall be utilized to mount the stabilizers and the reservoir for the aerial hydraulic system. |  |  |  |
| Technical specifications | Conform  Yes No | | Comments |
| 1. **STABILIZATION SYSTEM:**   The vehicle shall come equipped with an out-and-down stabilization system. The system shall consist of two (2) hydraulically-operated out-and-down style stabilizers welded to the torque box and mounted under the frame for a low center of gravity. |  |  |  |
| The stabilizers shall have a maximum spread of 16` across the centerlines of the footpads when fully extended. |  |  |  |
| The internal stabilizer tubes shall be 8” x 10” with 1/2” thick top and bottom plates and 5/8” thick sides. They shall be made of steel with a 100,000-psi minimum yield strength and shall be extended out by hydraulic cylinders. |  |  |  |
| The external stabilizer tubes shall be 9-3/4” x 11-3/4” with 3/8” wall thickness. The internal tubes shall slide on low friction pads. |  |  |  |
| The stabilizers shall provide the vehicle with a tip-over safety margin of 1.5 times the rated aerial ladder load in any position the aerial ladder can be placed when the vehicle is on a firm and level surface. |  |  |  |
| The aerial shall be able to sustain a 1-1/3 to 1 rated load on a 5-degree slope downward in the position most likely to cause overturning as outlined in **NFPA 1901 19.21.3.**1. |  |  |  |
| The maximum grade the apparatus can be set up on is 6.8 degrees (12 percent). On a 6.8-degree (12 percent) grade, the apparatus can be leveled within a 3.4 degree (6 percent) operating range with the apparatus cab facing uphill. |  |  |  |
| The stabilizer extension cylinders shall have a 2.5” bore and a 51.5” stroke. The stabilizer lift cylinders shall be mounted on the end of the stabilizer tube and shall have a 4” bore and a 22” stroke. |  |  |  |
| The stabilizer cylinders shall be supplied with dual pilot-operated check valves on each stabilizer cylinder to hold the cylinder either in the retracted (stowed) or the extended (working) position should a hydraulic line be severed at any point in the hydraulic system. Stabilizers shall contain safety lock valves.  This assures there will be no” leak down” of stabilizer legs. Mechanical pins are not required. This feature contributes to efficient set-up and field operation. |  |  |  |
| Each stabilizer leg shall have a 1/8” thick bright aluminum diamond plate shield, full height and width of the stabilizer opening, attached to the end of the leg. This plate shall serve as a protective guard and a mounting surface for the stabilizer warning lights. The top, forward, and rear edges shall be flanged for added strength. |  |  |  |
| Each stabilizer shall have one (1) red warning light mounted on the outboard face of the protective guard. |  |  |  |
| The stabilizers shall be connected to a warning light in the cab to warn the operator when the stabilizers are deployed. A floodlight shall be provided in each stabilizer body opening to illuminate the stabilizer and the ground. The light shall automatically come on with the deployment of a stabilizer. |  |  |  |
| The ground contact area for each stabilizer shall be a 12” diameter circular disc without auxiliary stabilizer pads and a 24” x 24” square plate with auxiliary stabilizer pads deployed. The ground pressure shall not exceed 75 psi when the apparatus is fully loaded and the aerial device is carrying its rated capacity in every position. This shall be accomplished with the auxiliary stabilizer pads deployed. |  |  |  |
| Technical specifications | Conform  Yes No | | Comments |
| 1. **UPPER TURNTABLE;**   The upper turntable assembly shall connect the aerial ladder to the turntable bearing. It shall be fabricated from 3/8” A-572 grade 50 steel and shall have a mounting position for the aerial elevation cylinders, the ladder connecting pins, and the upper turntable operator`s position. |  |  |  |
| One (1) 34-1/4” diameter turntable bearing with a 3” drive gear face shall be bolted to the top of the bearing mounting plate with twenty-six (26) 3/4” diameter Grade 8 plated bolts. Gear teeth shall be stub tooth form. The rated overturning moment of the turntable bearing shall be a minimum of 238,000 ft-lbs. |  |  |  |
| The operator`s turntable platform shall be constructed of 3/16” aluminum treadplate with” Gator Grip” non-skid integral surface mounted on a tubular frame. |  |  |  |
| The platform shall extend from the left side of the aerial control station to the right-side ladder rail. The platform shall extend 23” from the pedestal control station base, with a width of approximately 18”. |  |  |  |
| The rear of the platform shall extend approximately 19” back from the turntable gear pedestal and shall be approximately 40” wide at the rear. |  |  |  |
| The platform shall be fastened by grade 8 bolts. Two (2) tubular steel handrails, each with an anti-slip finish, shall be installed on the on the right and left sides of the turntable platform. |  |  |  |
| Two (2) Fire Research brand ManSaver bars, equipped with tubular padding, shall be installed between the railings. The bars shall lift up and inward (towards the ladder) permitting easy entrance to the ladder and control console. The rails shall be a minimum 39-3/4” high and shall not increase the overall travel height of the vehicle.  The turn table shall include a black Linex Package. |  |  |  |
| Technical specifications | Conform  Yes No | | Comments |
| 1. **ELEVATION MECHANISM:**   Two (2) 5” diameter elevating cylinders shall be mounted on the underside of the base section of the aerial ladder.  The cylinders shall be black. |  |  |  |
| A 1-3/4” pin shall fasten each cylinder to the turntable and a 2” pin shall fasten each cylinder to the aerial ladder. |  |  |  |
| The elevating cylinders shall be mounted utilizing spherical bearings on both ends of the cylinders. The cylinders shall function only to elevate the ladder and not as a structural member to stabilize the ladder side movement. |  |  |  |
| The elevating cylinders shall be provided with pilot-operated check valves to prevent movement of the ladder in case of a loss of hydraulic pressure. The elevating cylinders shall be able to raise and lower the aerial ladder to any angle from -8 degrees to +76 degrees. |  |  |  |
| The elevation system shall be designed following the current edition of NFPA 1901. The elevation cylinders shall incorporate cushions on the upper limit of travel. The elevation cylinders shall also serve as a locking device to hold the aerial in the stored position for road travel. |  |  |  |
| Technical specifications | Conform  Yes No | | Comments |
| 1. **ROTATION MECHANISM:**   The aerial shall be supplied with a powered rotation system as outlined in the current edition **of NFPA 1901**. |  |  |  |
| This system shall provide continuous rotation under all rated conditions and shall be supplied with a brake to prevent unintentional rotation.  Rotation shall be accomplished by a high-torque hydraulic motor driven through a spring-engaged, hydraulically-released, multiple-disc brake into a planetary gear box. |  |  |  |
| The gear box shall have a minimum continuous torque rating of 60,000 in. lbs. and a minimum intermittent torque rating of 120,000 in. lbs. The turntable bearing, ring gear teeth, spur gear, planetary gear box, and output shaft shall have a minimum safety factor of 2.5 to 1. |  |  |  |
| **Hydraulic Swivel**  A hydraulic swivel shall be installed to provide hydraulic fluid transfer to the aerial ladder cylinders, electrical power to the aerial ladder, and water delivery to the pre-plumbed waterway while permitting continuous 360-degree rotation. The swivel shall be environmentally-sealed to prevent contamination of the hydraulic fluid. The swivel shall include a 4” passage for waterflow. The number of hydraulic ports and electrical circuits shall be dependent on the type of aerial control system as noted below: |  |  |  |
| * Control System Hydraulic Ports Electrical Circuits |  |  |  |
| * Direct hydraulic controls 8 24 |  |  |  |
| * Advanced Aerial Control System 5 28 |  |  |  |
| * Advanced Aerial Control System - Deluxe 5 36 |  |  |  |
| Technical specifications | Conform  Yes No | | Comments |
| 1. **AERIAL LADDER CONTROL STATION:**   An aerial ladder control station shall be supplied as outlined in the current edition of **NFPA 1901**. The control station shall be located on the left side of the aerial turntable. |  |  |  |
| The apparatus shall be supplied with labels to warn of electrocution hazard. The control console shall provide a service access door on the front and side of the console to access hydraulic and electrical connections. The electrical panel shall be contained in a junction box with labeled wires. The control console shall be angled, labeled, and supplied with lights for night operation. |  |  |  |
| **Console Cover**  A diamond plate contoured hinged cover shall be supplied to protect the console from the elements. The cover shall latch in the stored position and swing away from the console so as not to interfere with sight of the aerial device. |  |  |  |
| **Aerial Ladder Control Levers**  The control levers shall be arranged as outlined in the current edition of **NFPA 1901**. The first lever from the left shall be the extension control (forward for extend and back for retract). The second lever shall be the rotation control (forward for clockwise and back for counter clockwise). |  |  |  |
| The third handle shall be the elevation control (forward for down and back for up). The aerial shall employ direct hydraulic controls for precise control and dependable service with minimal electrical functions. A ring around the control levers shall be provided to prevent unintentional movement. |  |  |  |
| Technical specifications | Conform  Yes No | | Comments |
| 1. **AERIAL CONTROLS:**   **Aerial Control System**  The aerial hydraulic system shall be equipped with a microprocessor based electric over hydraulic control system. The system shall include electronic ramping to provide smooth acceleration and deceleration of aerial functions during sudden movements of the operator control levers. The ladder shall utilize three (3) combination proportional control valves for smooth aerial device movements. The hydraulic system valve body shall be located in the turntable console. |  |  |  |
| The control system shall have manual overrides in the event of a system failure. The overrides shall be located directly on the electric / hydraulic control valve within easy reach of the turntable operator. The manual system shall be organized to match the base controllers with the functions clearly labeled. |  |  |  |
| The switch modules on the console shall be CAN based for reliable operation. |  |  |  |
| An emergency stop switch shall be provided on the console that de-energizes the PTO in the event the aerial must be stopped immediately. |  |  |  |
| Aerial Speed Switch  The control system shall be provided with a "creep speed" switch for precise aerial movement. When activated, the aerial shall operate a slow speed and the chassis engine will remain at idle speed. |  |  |  |
| **Variable Ramping**  A three (3) position switch shall be provided to select system ramping (ladder movement when initiating or ceasing movement of a control lever). The switch shall allow selection of normal, firm or soft ramping based on operator preference. |  |  |  |
| **Display**  A CAN based multifunction display shall be installed on the turntable control console. The display shall be a 3.2" backlit LCD to provide daylight readability and be IP67 rated. The display shall contain four (4) integrated navigation buttons and communicate via J1939 protocol. |  |  |  |
| The display shall provide the following information:   * Hydraulic system pressure |  |  |  |
| * Aerial hours |  |  |  |
| * Waterway flow |  |  |  |
| * Total waterway flow (with reset button) |  |  |  |
| The display shall be capable of showing system units in standard or metric values. |  |  |  |
| The background of the display shall change color based on status. Colors shall be blue/green for normal, yellow for caution and red for warning. |  |  |  |
| If equipped with short jacking feature the display shall provide the following additional information:   * Rotation limited indicator |  |  |  |
| * Aerial angle in degrees |  |  |  |
| * Aerial tip load represented in 250 lb increments via simple firefighter icons |  |  |  |
| * System limit notifications (Example: "Right Rotation Limited – Short Jack") |  |  |  |
| **Stow Switch**  The control system shall also include a switch to deploy and stow the waterway monitor (if equipped with a pre-piped waterway).  Cradle Alignment Light |  |  |  |
| A green light shall be provided at the turntable control console to indicate when the aerial is aligned for bedding. |  |  |  |
| Technical specifications | Conform  Yes No | | Comments |
| 1. **AERIAL LADDER ALIGNMENT INDICATOR AND LOAD INDICATION SYSTEM:**   **Rung Alignment Indicator**  A light on the control console shall indicate when the ladder rungs are aligned for climbing.  Aerial Ladder Alignment Indicator  A reflective arrow mounted to the body and the turntable shall indicate when the aerial ladder is aligned with the forward aerial ladder support. |  |  |  |
| **Load Indication System**  A lighted elevation/safe-load indicator diagram shall be located on the lower left side of the base section to indicate safe load capacity at any angle of elevation. |  |  |  |
| The safe load indicator shall be 15” x 15” in size and shall clearly communicate the aerial ladder capacity in any one of the following conditions: tipload, tipload with water flowing, and distributed load at full extension. The chart shall identify capacity using graphic characters to indicate each 250-lb. increment. |  |  |  |
| The chart shall be equipped with lighting and warn of electrocution hazards from power lines and lightning. |  |  |  |
| An extension indicator shall be located on the handrails of the base section to indicate feet of extension. |  |  |  |
| The control pedestal shall also come equipped with a hydraulic oil pressure gauge and lights for night operation. |  |  |  |
| Technical specifications | Conform  Yes No | | Comments |
| 1. **STABILIZER CONTROLS:**   The main stabilizer control panel shall be located on the rear of the apparatus to control the operation of the stabilization system. |  |  |  |
| The panel shall be labels ”JACKS” and shall provide a master on-off power switch and indicator light, two (2) yellow indicator lights - one (1) for the left jack and one (1) for the right jack - to signify when each jack is fully extended and is in firm contact with the ground, a green interlock indicator light to signify when both jacks (stabilizers) are set, and a manual transfer switch to allow the operator to manually shift the hydraulic power from the jacks (stabilizers) to the ladder once the interlock light is green. |  |  |  |
| Horizontal extension and vertical lift of the stabilizers shall be controlled by two (2) switches - one (1) for the left stabilizer and one (1) for the right stabilizer - located at the rear of the apparatus just above the brake light on each side, so that the operator may observe the stabilizers during deployment. In operation, the stabilizer on each side must be fully extended horizontally before hydraulic power is automatically shifted to the vertical lift cylinder to level the vehicle. An audible alarm with a minimum 87 dbA shall sound while the stabilizers are in motion as required by the current edition of **NFPA 1901.** Stabilizer deployment from the stored position to the operating position shall be completed in less than 60 seconds. **NO EXCEPTION** |  |  |  |
| Two (2) switches to activate the auxiliary hydraulic pump shall also be provided - one (1) on each side below the stabilizer switch - to retract the stabilizers in case the main hydraulic pump fails. The stabilizer switch and the auxiliary hydraulic pump switch on each side shall be protected from impacts by an inverted U-shaped guard made from aluminum diamond plate. |  |  |  |
| Two (2) switches - one (1) on each stabilizer leg - shall sense when the leg is in firm contact with the ground. This condition shall be indicated on the main stabilizer control panel by a yellow indicator light for each side. |  |  |  |
| Leveling of the apparatus shall be performed manually by the operator using two (2) color-coded level indicators at the rear of the apparatus in order to ensure a visual confirmation that it is safe to operate the aerial ladder. The indicator for the front-to-rear level shall be located inside the aerial ladder turntable stairwell on the left side of the vehicle near the rear. The indicator for the side-to-side level shall be located above the rubrail on the rear of the vehicle near the rear suction inlet. **NO EXCEPTIONS** |  |  |  |
| The aerial ladder hydraulic system shall be provided with an interlock that prevents rotation of the aerial ladder until both the stabilizers are down and properly set. Additionally, the system shall not permit stabilizer movement unless the aerial ladder is seated in the forward aerial support cradle in the travel position. The interlock system shall have a manual override with access through a door at the rear of the truck. |  |  |  |
| Technical specifications | Conform  Yes No | | Comments |
| 1. **SHORT JACKING SYSTEM:**   The stabilizers shall be capable of multi-range short jack operation. |  |  |  |
| The short jacking operation will allow for rapid set-up in congested/restricted areas. |  |  |  |
| When short jacking is employed the aerial device shall be capable of operating within a 200-degree side envelope which includes the capacity to go 10 degrees past center both front and rear. |  |  |  |
| The ability to set-up in congested areas is further enhanced in that mechanical safety pins are not required thus permitting the short side stabilizer to be deployed without having to be extended. |  |  |  |
| The system electronics shall be configured so as to prevent rotation to the short jack side and shall utilize proximity switches located outboard of the rotation gear. |  |  |  |
| The system electronics shall also be configured so as to eliminate the requirement for a momentary switch to be engaged for operation in short jack mode. This function allows for normal aerial control operation during short jack deployment. |  |  |  |
| The system shall also have the capability to be double short jacked. This is particularly applicable for maintenance/servicing situations which may occur in extremely tight areas. This configuration shall allow the cab to be tilted without having to extend the outriggers. The ladder shall be capable of being rotated 20 degrees in this mode (10 degrees either side of center). |  |  |  |
| When double short jacked, the aerial shall also be capable of operating in a 20 degree range off the rear as well. Rotation to the rear double short jack operation zone shall be permitted only by first raising the fully retracted ladder to maximum elevation to prevent an un-stable condition. |  |  |  |
| There shall be two (2) red rotation indicator lights, one (1) left and one (1) right, prominently displayed on the aerial control console. The lights shall flash when their respective stabilizer is not fully deployed. |  |  |  |
| Technical specifications | Conform  Yes No | | Comments |
| 1. **ARIAL WATERWAY:**   One (1) 1,000 gpm pre-piped waterway shall be supplied as outlined in the current edition of NFPA 1901. |  |  |  |
| The waterway shall telescope to the end of the fly section. A waterway of 4” internal diameter shall pass through the turntable and a swivel joint to connect to the tubular aerial waterway. The tubular waterway shall run under the aerial ladder. |  |  |  |
| The waterway tubes shall have the following sizes: |  |  |  |
| * Base Section: 4-1/2” OD |  |  |  |
| * Mid Section: 4” OD |  |  |  |
| * 3rd Section: 3-1/2” OD |  |  |  |
| The base section shall be constructed of regular aluminum and the second and third sections of the waterway shall be constructed of hard coat anodized aluminum and shall telescopic with the aerial ladder through sealed slip joints. The slip joints shall be designed with grease zerk fittings to facilitate lubrication. |  |  |  |
| A 1-1/2” drain valve shall be installed and operated from the rear of the apparatus to drain the waterway. |  |  |  |
| The water system shall be capable of flowing 1,000 gpm at 100 psi nozzle pressure at full elevation and extension. The friction loss between the tip and below the swivel shall not exceed 100 psi while flowing 1,000 gpm as outlined in **NFPA 1901.** |  |  |  |
| **Waterway Relief Valve**  An automatic relief valve pre-set at 250 psi shall be installed in the aerial waterway to prevent over-pressurization of waterway system. The relief valve shall be mounted in the lower portion of the waterway where it enters the aerial torque box frame and dumps under the apparatus. |  |  |  |
| A remote-controlled monitor/nozzle assembly shall be attached to a ladder fly section through C-channel slide pads which shall allow the monitor/nozzle assembly to be positioned at the tip of a section for maximum master stream reach or at the tip of the next section down for unobstructed rescue capabilities. |  |  |  |
| The monitor/ nozzle assembly shall be pinned at either operating location with a single stainless steel” T” handle locking ball pin. A monitor control station shall be attached to the sliding monitor/nozzle assembly and shall move with it. |  |  |  |
| The turntable monitor controls shall be connected to the sliding monitor system using an electronic multiplexing system that sends all monitor control signals over a shielded pair of wires through a spring retract electric cable reel. The collector rings in the cable reel shall be specifically designed for accurate transmission of electronic signals. |  |  |  |
| A gel-cell rechargeable battery shall be located on the sliding monitor assembly. A dedicated ground wire and 12VDC positive charging wire shall be routed from the turntable control station through the electric cable reel to the monitor battery. |  |  |  |
| The charging wire shall be directly connected to the chassis 12VDC battery system through a 20 amp auto reset circuit breaker.  The moveable monitor/nozzle assembly shall be capable of flowing from 300 gpm to 1000 gpm while maintaining a constant 80-100 psi nozzle pressure for maximum stream projection. |  |  |  |
| **Waterway Inlet**  One (1) 4” inlet shall be provided at the rear of the apparatus and shall be connected to the vertical pedestal waterway piping to supply water to the aerial waterway from an outside source. |  |  |  |
| All fabricated piping shall be constructed of a minimum of Schedule 10 stainless steel piping to help prevent corrosion. The threads shall be NST. A long handle chrome plated 4” NST cap shall be installed on the inlet. |  |  |  |
| **Waterway Dual Read Pressure Gauge**  The waterway dual read inlet gauges shall be 4“(101mm) diameter Innovative Controls dual read pressure gauges. |  |  |  |
| Each gauge shall have a rugged corrosion free stainless steel case and clear scratch resistant molded crystals with captive O-ring seals to ensure distortion free viewing and seal the gauge. |  |  |  |
| The gauges shall be filled with a synthetic mixture to dampen shock and vibration, lubricate the internal mechanisms, prevent lens condensation and ensure proper operation from –40F to +160F. |  |  |  |
| Each gauge shall exceed ANSI B40.1 Grade A requirements with an accuracy of +/- 1.5% full scale and include a size appropriate phosphorous bronze bourdon tube with a reinforced lap joint and large tube base to increase the tube life and gauge accuracy. |  |  |  |
| A polished chrome-plated stainless steel bezel shall be provided to prevent corrosion and protect the lens and gauge case. |  |  |  |
| The gauges shall be installed into decorative chrome-plated mounting bezels that incorporate valve-identifying verbiage and/or color labels.  The gauges shall display a range from 0-2750KPA/0-400PSI with black graphics on a white background. |  |  |  |
| Technical specifications | Conform  Yes No | | Comments |
| 1. **MONITOR:**   The aerial ladder shall be equipped with an Akron style 3480 StreamMaster II electrically controlled monitor. The monitor shall be made from Akron`s unique lightweight Pyrolite construction to minimize ladder tip loads. |  |  |  |
| The monitor shall be equipped with an Akron style 5177 Akromatic electrically controlled automatic nozzle capable of discharging 250-1,250 gpm at 80 psi nozzle pressure. This waterflow capability shall be available at any extension, elevation, or position without any restrictions while flowing 1,000 gpm. A minimum stability factor of 1.5 to 1 shall be maintained in this configuration. |  |  |  |
| The operational range of the electric monitor and nozzle shall be 135 degrees through the vertical plane (90 degrees upwards from a line perpendicular to the aerial ladder and 45 degrees downward), and 180 degrees through the horizontal plane (90 degrees to either side of the aerial ladder center line). The monitor shall be able to move in the horizontal and vertical axis simultaneously |  |  |  |
| The monitor relay box shall include an electronic control system that is attached to the inlet base of the monitor and be totally encapsulated to prevent moisture intrusion. The monitor shall have fully enclosed motors and gears with built in manual override capability and quick-attach handles. A battery, which continuously charges from the vehicle power system shall provide power for monitor movement. Systems which do not utilize a battery shall not be acceptable due to the higher incidence of failure with this type of system. **NO EXCEPTIONS.** |  |  |  |
| Control switches for horizontal movement, vertical movement and pattern selection shall be located at the control panel. |  |  |  |
| Monitor Tip Controls  In addition to the controls at the operator console, electric monitor directional and stream controls shall be installed in close proximity to the monitor on the ladder to allow operation by a firefighter on the ladder. |  |  |  |
| Technical specifications | Conform  Yes No | | Comments |
| 1. **AERIAL WARNING LIGHTS:**   Two (2) Truck-Lite model 91 LED outrigger warning lights with red lenses shall be provided.  The lights shall be surface mounted on the outrigger covers in compliance with current **NFPA 1901.** |  |  |  |
| Technical specifications | Conform  Yes No | | Comments |
| 1. **AERIAL LIGHTING:**   **Outrigger Flood Lights**  FRC Sobrite 12 volt LED flood lights model 81380 shall be installed in each outrigger location to illuminate the outriggers and ground. The lights shall have a black powder coated die cast aluminum housing for corrosion resistance and automatically turn on when the stabilizers are deployed. |  |  |  |
| **Ladder Climbing Lights**  A Luma-Bar Pathfinder LED lighting system shall be provided to illuminate the climbing area inside each ladder section. The strip type lights shall be located above ladder rung level and directed toward the centerline of the ladder to reduce glare. The lights shall be mounted to a 1.25" x .5" x .125" extruded aluminum channel and wired to not be an obstruction during climbing. The lights shall be controlled with the ladder lights switch at the operators control console. |  |  |  |
| The LED lights shall be Blue. |  |  |  |
| **LED Flood Light**  A Fire Research Spectra MS LED 12V model SPA570-R14 top mount fixed pedestal light shall be provided. The pedestal shall allow the lamp head to rotate 450 degrees and have a self adjusting friction brake to prevent arbitrary rotation. The pedestal shall have a round mounting base. The light shall be fitted with a weather-resistant switch and hard-wired to the aerial tip power circuit |  |  |  |
| Two (2) Fire Research Spectra LED 12v 14000 lumens shall be installed at the base of the arial. The switch shall be where the aerial controls are situated  Two (2) Fire Research Spectra LED 120v 28000 lumens shall be installed at the base of the arial. The switch shall be where the aerial controls are situated |  |  |  |
| The LED scene light shall be for fire service use. |  |  |  |
| Technical specifications | Conform  Yes No | | Comments |
| 1. **AERIAL HYDRAULIC SYSTEM OPTIONS:**   **Aerial Hydraulic Oil Level Gauge**  A hydraulic oil level gauge shall be supplied for easy fluid level verification. The three-light system shall indicate full oil level with a green light, acceptable oil level with yellow light, and low oil level with a red light. The display shall be located on pump operator's panel. |  |  |  |
| **Filter Isolation Kit**  Three (3) valves shall be provided to minimize fluid loss when changing the aerial hydraulic filter elements during routine maintenance. |  |  |  |
| One (1) 1” ball valve shall be installed at the inlet side of the return filter. Two (2) 3/4” check valves shall be installed on the pressure filter, one (1) on the inlet side and one (1) on the outlet side. |  |  |  |
| **Aerial Cold Weather Package**  The aerial hydraulic system shall be provided with a 1.5” suction hose to improve performance in cold weather climates. |  |  |  |
| Technical specifications | Conform  Yes No | | Comments |
| 1. **AERIAL EQUIPMENT:**   An axe bracket shall be provided on the aerial ladder. The bracket shall be Zico model# H-AB blade guard and PAC TRAC model# 1004 clamp for the handle. The bracket shall be designed to hold a 6-lb. axe.  Location: left side fly section. |  |  |  |
| There shall be an aluminum tube mounted directly on the ladder for storage of a 6`-pike pole. The tube shall be located right side tip of base section. |  |  |  |
| A lifting eye shall be provided at the tip of the ladder. The eye shall be constructed of aluminum with a slotted hole to allow for webbing to easily pass through. The lifting eye shall allow for a load equal to the rated tip load capacity of the ladder, up to 500 pounds.  A dual rope roller shall be provided to aid in rope rescue operations. |  |  |  |
| The rope roller shall consist of a welded aluminum frame, two aluminum pulleys and a lifting handle. The assembly shall be portable allowing it to be placed in various locations along the ladder. The assembly shall be held in place between rungs through the use of two (2) 1/2” locking pins. The pulleys shall be rated for 250 lbs. each. |  |  |  |
| Brackets shall be provided to mount a stokes basket to the aerial base section while not in use. Brackets shall hold a Ferno Model 71 stokes. The stokes basket shall mount on the base section on the left side towards front. Stokes not included. |  |  |  |
| Technical specifications | Conform  Yes No | | Comments |
| 1. **AERIAL LADDER BRACKETS:**   A lift-out style roof ladder mounting bracket shall be installed on the outside of the ladder base section. The bracket shall be designed to hold a PRL-12 on right side of base section. |  |  |  |
| Technical specifications | Conform  Yes No | | Comments |
| 1. **SIGN PLATES:**   Two (2) 10” x 144” x 1/8” (0.125”) thick smooth aluminum plates shall be provided. The plates shall have 1” lips top and bottom for rigidity. Each sign plate shall be bolted on either side of the base section, approximately at the midpoint. |  |  |  |
| The plates shall be provided to display the department`s name or other information. The plates shall be painted Job Color as specified by the customer. |  |  |  |
| Technical specifications | Conform  Yes No | | Comments |
| 1. **BODY PAINT PROCESS:**   All bright metal fittings, if unavailable in stainless steel shall be heavily chrome plated. Iron fittings shall be copper plated prior to chrome plating. If applicable, any and all accessory times shall be removed from the body prior to cleaning and painting. Any accessory items that are to be painted, shall be painted separately and installed after the body is painted and cured. |  |  |  |
| All seams shall be caulked both inside and along the exterior edges with a urethane automotive sealant to prevent moisture from entering between any body panel. |  |  |  |
| The body and all parts shall be thoroughly washed with a grease cutting solvent (PPG DX330) prior to any sanding. After the body has been sanded and the weld marks and minor imperfections are filled and sanded, the body shall be washed again with (PPG DX330) to remove any contaminants on the surface. |  |  |  |
| The next two to four coats (depending on need) shall be a PPG DelFleet F4936 High Solids Epoxy Gray Primer. The film build shall be 4-6 mils when dry. The primer surface coat, after appropriate dry time, shall be sanded with 320-600 grit sandpaper to ensure maximum gloss of the paint. The last step is the application of at least three coats of PPG DelFleet polyurethane two-component color (single stage). The film build being 2-3 mils dry. The single stage acrylic urethane, when mixed with component (PPG F3270) catalyst shall provide a UV barrier to prevent fading and chalking |  |  |  |
| All products and technicians are certified by PPG every two (2) years. |  |  |  |
| One (1) two (2) ounce bottle of touch-up paint shall be furnished with the completed truck at final delivery. |  |  |  |
| Technical specifications | Conform  Yes No | | Comments |
| 1. **INTERIOR COMPARTMENT FINISH:**   Six (6) apparatus side compartment interiors are to be painted with a yellow Zoloton finish material. The compartments shall be cleaned with a grease remover, and then the surface sanded and prepared for painting. |  |  |  |
| Technical specifications | Conform  Yes No | | Comments |
| 1. **UNDERCOATING:**   The entire underside of the single axle apparatus body is to be cleaned and properly prepared for application of a sprayed on automotive type undercoating for added corrosion resistance. Undercoating is to be a solvent based, rubberized coating, black in color. |  |  |  |
| Technical specifications | Conform  Yes No | | Comments |
| 1. **SIMULATED GOLD LEAF LETTERING:**   The lettering shall be applied in simulated gold leaf material, shaded in black and encapsulated in clear Mylar. |  |  |  |
| A quantity of fifty (50), four (4) inch letters are to be placed on the cab and on the body as directed by fire department. |  |  |  |
| Technical specifications | Conform  Yes No | | Comments |
| 1. **KEEP BACK SIGN:**   "KEEP BACK 500 FEET/METERS" sign with reflective lettering shall be provided and installed on the rear of the vehicle as directed by the Fire Department. |  |  |  |
| Technical specifications | Conform  Yes No | | Comments |
| 1. **STRIPING:**   Mylar gold leaf striping shall be applied at the paint break line on the apparatus cab. |  |  |  |
| A 6" wide 3M brand Scotchlite #680-10 reflective stripe shall be affixed to the perimeter of the vehicle. Striping shall be placed up to 60" above ground level and shall conform to the applicable NFPA reflectivity requirements. At least 50% of the perimeter length of each side and width of the rear and at least 25% of the perimeter width of the front of the vehicle shall have reflective stripe. |  |  |  |
| The color of the 3M brand striping material shall be white on the painted surfaces and red in the roll up doors. |  |  |  |
| Technical specifications | Conform  Yes No | | Comments |
| 1. **CHEVRON STRIPING:**   The front bumper shall have 3M reflective red and yellow striping installed. The chevron style striping shall be applied at a 45-degree upward angle. |  |  |  |
| The chevron shall by of the diamond and the color shall be determined t the pre con meeting. |  |  |  |
| Technical specifications | Conform  Yes No | | Comments |
| 1. **WHEEL CHOCKS:**   Two (2) wheel chock holders shall be mounted in the apparatus body. |  |  |  |
| Two (2) large aluminum wheel chocks shall be provided. |  |  |  |
| Technical specifications | Conform  Yes No | | Comments |
| 1. **ELECTRIC SIREN AND CONTROL:**   One (1) **Whelen model #295SLSA1** electronic siren shall be mounted in the cab. This unit shall feature an electronic air horn, wail, yelp, hi-lo and shall have a hard-wired PA microphone. |  |  |  |
| The unit shall be capable of driving a single high power speaker up to 200 watts to achieve a sound output level that meets Class ”A” requirements. |  |  |  |
| Operating modes shall include Hi-Lo, yelp, wail, P.A., air horn and radio re-broadcast.  The siren shall be recessed mounted in the cab |  |  |  |
| The electronic siren control shall be located in the center overhead console offset to driver side |  |  |  |
| **Siren Speaker**  One (1) Federal Signal model ES100 Dynamax 100-watt speaker shall be flush mounted as far forward and as low as possible on the front of the vehicle. A polished model MSFMT with a stainless-steel grille shall be provided on the outside of the speaker to prevent road debris from entering the speaker. |  |  |  |
| Speaker dimensions shall be: 5.5 in. high x 5.9 in. wide x 2.5 in. deep. Weight = 5.5 lbs.  The speaker shall produce a minimum sound output of 120 dB at 10 feet to meet current **NFPA 1901** requirements.  The speaker shall be located driver side front  bumper. |  |  |  |
| Technical specifications | Conform  Yes No | | Comments |
| 1. **EMERGENCY LIGHTING:**   A pair of **Whelen Mini Freedom Iv Rota-beam model R4BRWWRP** shall be installed on the roof on each side of ladder beam. |  |  |  |
| The white LEDs shall be switched off in blocking right of way mode |  |  |  |
| The light bars shall be installed in the following location: front cab corners |  |  |  |
| **Light Bar Mount**  Two (2) pairs of 2" tall mounts shall be provided on the front mini light bars |  |  |  |
| **Lower Level Warning Light Package**  Ten (10) **Whelen M6 LED** light heads with red lenses and bezels shall be provided. |  |  |  |
| The rectangular lights shall be wired with weatherproof connectors and shall be mounted as close to the corner points of the apparatus as is practical as follows: |  |  |  |
| * Two (2) **Whelen M6** lights on the front of the apparatus facing forward. |  |  |  |
| * Two **(2) Whelen M6** lights on the rear of the apparatus facing rearward. |  |  |  |
| * Two (2) **Whelen M6** lights each side of the apparatus, one (1) each side at the forward most point (as practical), and one (1) each side at the rearward most point (as practical). |  |  |  |
| * One (1) **Whelen M6** light each side of the apparatus centrally located to provide mid ship warning light. |  |  |  |
| The side facing lights shall be located at forward most position, on side of cab down low just ahead of rear door, and on rear fixed outrigger cover. |  |  |  |
| All warning devices shall be surface mounted in compliance with NFPA standards. |  |  |  |
| The lower level **Whelen M6 LED** warning lights shall be set to DoubleFlash Simultaneous pattern. |  |  |  |
| Two (2) pair of Red (4 total) **Whelen L32LF** LED beacons designed specifically for rugged applications shall be provided on the unit. |  |  |  |
| Location: One (1) each side of pump module offset to the rear and one (1) each side rear upper body on aerial style brackets. |  |  |  |
| Two (2) pair of Red (4 total) **Whelen M2** shall be installed in the rubrail, one pair near the front and one Pair near the rear. |  |  |  |
| Technical specifications | Conform  Yes No | | Comments |
| 1. **HAZARD (DOOR AJAR) LIGHT:**   There shall be a 2” red LED hazard light.  The light shall be located center overhead. |  |  |  |
| Technical specifications | Conform  Yes No | | Comments |
| 1. **ADDITIONAL EQUIPEMENT SUPPLIED WITH THE APPARATUS:**   The following equipment shall be supplied with the apparatus: |  |  |  |
| **HYDRAULIC GENERATOR:**  A Harrison model MCR 10KW hydraulic generator system shall be supplied and installed above R1. The generator shall come with an axial piston hydraulic pump, reservoir, cooler, voltage regulator and a gauge panel.  The gauge panel shall display voltage, hour meter, frequency, and amperage.  The hydraulic motor-generator system shall be modular design with dimensions of approximately 33” long x 14.2” wide x 18.1” high and shall be permanently mounted on the apparatus.  The hydraulic pump shall be driven by a chassis transmission mounted power take off (PTO).  A generator control / PTO engage switch shall be mounted on the cab instrument panel to engage the PTO and start the generator.  Ratings and Capacity  Rating: 10,000 watts continuous  Volts: 120/240 volts  Phase: Single, 4-wire  Frequency: 60 Hz  Amps: 42 amps at 240 volts, 84 amps at 120 volts  Engine Speed at Engagement: Idle  Pump Speed Operating Range: 980 to 3300 RPM  Weight: Approximately 245 lbs.  Testing  The generator shall be tested in accordance with current NFPA 1901 standards.  Notes:  \*All ratings and capacities shall be derived utilizing current NFPA 1901 test parameters.  \*Extreme ambient temperatures could effect generator performance.  **GENERATOR TEST**  3rd Party Generator Testing  The generator shall be tested at the manufacturer`s facility by an independent, third-party testing service. The conditions and testing of the generator shall be as outlined in current NFPA 1901.  The test shall include operating the generator for two hours at 100% of the rated load. Power source voltage, amps, frequency shall be monitored. The prime mover`s oil pressure, water temperature, transmission temperature (if applicable) and power source hydraulic fluid temperature (if applicable) shall be monitored during testing.  The results of the test shall be recorded and provided with delivery documentation.  **BREAKER BOXES**  Circuit Breaker Panel  A twelve (12) place breaker box with up to twelve (12) appropriately sized ground-fault interrupter circuit breakers shall be supplied. The breaker box will include a master breaker sized according to the generator output. The breaker box will be located in the specified compartment, not to exceed 12` run of wire.  Note: If generator is 5.5KW or less, the main breaker will occupy 2 places, leaving 10 available.  Dimensions: 17.92” high x 14.25” wide x 3.75” deep.  Location: L1 forward wall.  **Electric cord reel.**  Rollers, Cord Reel  Rollers, captive for cord reel mounted on reel.  Stainless steel cord reel rollers shall be installed and located on the reel.  The rollers shall facilitate smooth removal of the electric cord.  {May include a bracket (as required)  Electric Cord Reel  Hannay electric rewind cord reel(s) (ECR 1616-17-18) shall be installed and located ceiling mount turntable access door area.  The reel(s) shall include 200`of yellow 10 gauge 3 conductor type SOWA cord. The cord shall be rated at 20 amps @ 110 volts. The end of the cord shall be terminated for the installation of a department required connector.  Daniel Woodhead Junction Box  A Daniel Woodhead 3290-3 junction box with four (4) 20 amp 110 volt twist lock receptacles NEMA L5-20 shall be hardwired to the cord reel. The receptacles shall be enclosed in a UL listed box with yellow Neotex rubber finish and NFPA required power on indicator light.  Located on cord for reel in ceiling mount turntable access door area.  Cord Reel Rewind Switch  A heavy-duty rubber covered electric reel rewind button shall be installed rear of body near cord reel compartment.  Junction Box Mount  A mounting box shall be installed for the Woodhead junction box. The box shall be constructed from 1/8" aluminum diamond plate.  Mount located for box with reel in or on ceiling mount turntable access door area.  Two 15amps double receptacles shall be provided, one in each well. |  |  |  |
| **ADDITIONAL EQUIPMENT:** |  |  |  |
| * 800 Feet of 2-1/2 in double jacket hose in 50ft lengths with QST couplers |  |  |  |
| * 800 Feet of 4 in rubber supply hose with Storz couplers |  |  |  |
| * 300 ft of 1-3/4 double jacket hose |  |  |  |
| * 1 6in bottom strainer |  |  |  |
| * 1 6in floating strainer |  |  |  |
| * 2 4-foot pike poles with D handle |  |  |  |
| * 2 8-foot pike poles * 3 6-foot pike poles |  |  |  |
| * 2 10-foot pike pole |  |  |  |
| * 1 6lb flat head axe |  |  |  |
| * 1 6lb pick head axe |  |  |  |
| * 6 Streamlight model Survivor LED with 12 volt chargers |  |  |  |
| * 1 5 gallons’ water extinguisher |  |  |  |
| * 2 hydrant wrenches |  |  |  |
| * 4 combination spanner wrenches |  |  |  |
| * 20 Pak 1004 brackets |  |  |  |
| * 2 hydrant wrench brackets |  |  |  |
| * 2 Combination spanner wrench brackets |  |  |  |
| * Three (3) triangular warning reflectors with carrying case shall be supplied to satisfy the DOT requirement. |  |  |  |
| * 3 haligan bars |  |  |  |
| * 1 20-pound sledge hammer |  |  |  |
| * 1 10-pound sledge hammer |  |  |  |
| * 1 Back board |  |  |  |
| * 1 full trauma kit |  |  |  |
| * 1 4 gas detector MSA Altair 4 with a Galaxy automated test system or equivalent. |  |  |  |
| * 1 thermal imager MSA 6000x with 12-volt charger (Shall be installed in the cab of the truck) or equivalent. * 1 10-foot folding ladder * 1 14-foot hook ladder * 1 16-foot hook ladder * 1 28-foot extension ladder * 1 35-foot extension ladder * 1 stoke basket with mounting bracket on the aerial beam. |  |  |  |
| Technical specifications | Conform  Yes No | | Comments |
| 1. **WARRANTY:**   The bidder shall warranty each new motorized fire apparatus for a period of **ONE YEAR** from the date of delivery, except for chassis and other components noted herein. |  |  |  |
| The warranty on the chassis and chassis supplied components, storage batteries, generators, electrical lamps and other devices subject to deterioration is limited to the warranty of the manufacturer there of and adjustments for the same are to be made directly with the manufacturer by the customer. |  |  |  |
| This warranty will not apply to any fire apparatus that has been repaired or altered outside our factory in any way, which in our opinion might affect its stability or reliability. |  |  |  |
| This warranty shall not apply to those items that are usually considered normal maintenance and upkeep services: including, but not limited to, normal lubrication or proper adjustment of minor auxiliary pumps or reels. |  |  |  |
| This warranty is in lieu of all other warranties, expressed or implied, and all other obligations or liabilities on our part. We neither assume nor authorize any person to assume for us any liability in connection with the sales of our apparatus unless made in writing by the bidder |  |  |  |
| The warranties shall be: |  |  |  |
| * Aluminum body warranty: five (5) year |  |  |  |
| * Cab and body paint: Ten (10) years |  |  |  |
| * Pump: five (5) years |  |  |  |
| * Stainless steel plumbing: Ten (10) years |  |  |  |
| * Engine Five: (5) years |  |  |  |
| * Transmission: Five (5) years |  |  |  |
| * Front axle and rear differential: two (2) years |  |  |  |
| * Frame: Life time |  |  |  |
| * Cab and body structural: Ten (10) years |  |  |  |
| * Year Aerial Device Structural Warranty: Twenty (20) years |  |  |  |
| * Frame corrosion: Twenty (20) years |  |  |  |
| * All other components and accessories shall be warrantied by their specific manufactures. |  |  |  |

**IN CONSIDERATION OF THE ABOVE, THE BIDDER’S TOTAL OFFER IS:**

**PRICE SUBMISSION CHART:**

|  |  |
| --- | --- |
| **Truck no 1 Mistassini** | **Price submitted** |
|  |  |
| **Delivery costs by road** |  |
| **Additional equipment** |  |
| **Total bid truck 1** |  |

**Total price submitted: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**

Executed in \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_, on \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_2019