Greenfield Fire District
Maple Ave Fire Company
Engine Rescue

INTRODUCTION
PROPOSAL REQUIREMENTS

GENERAL INFORMATION

It is the intent of these specifications to secure apparatus constructed to withstand the severe and continuous use encountered during emergency fire fighting services. The apparatus must be of the latest type, carefully designed and constructed with due consideration to the nature and distribution of the load to be sustained.

These specifications detail the requirements for general design criteria of cab and chassis components, aerial device, fire pump and related components, water tank, fire body, electrical components, painting, and equipment. In evaluating the bid proposals to determine which proposal is the most advantageous, these major items shall be considered.

Apparatus and equipment must meet the specific requirements and intent of the requirements as specified herein. All items of these specifications shall conform to the character of the proposed apparatus and the purpose for which it is intended. Criteria as specified by the National Fire Protection Association Pamphlet No. 1901, latest edition, entitled "Suggested Specifications for Motor Fire Apparatus", as approved by the American Insurance Association and International Association of Fire Chiefs, are hereby adopted and made a part of these specifications the same as if they were written out in full, insofar as they apply and are not specifically modified in the following detailed specifications. Each bidder shall provide only that equipment as required in the following specifications.

The fire apparatus and equipment to be furnished in meeting these specifications must be the products of an established, reputable fire apparatus and/or equipment manufacturer. Each bidder shall furnish satisfactory evidence of the manufacturer's ability to construct, supply service parts and technical assistance for the apparatus specified. Each bidder must state the location of the factory and location for post delivery service.

The chassis shall be certified by the apparatus manufacturer as conforming to all applicable Federal Motor Vehicle Safety Standards in effect at the date of contract. This shall be attested to by the attachment of a FMVSS certification label on the vehicle by the contractor who shall be recognized as the responsible final manufacturer.

BIDDER INSTRUCTIONS

Bids shall be addressed and submitted in accordance with the advertised "Bid Notice". The words "Fire Apparatus Bid", the date, and the bid opening time must be stated on the face of the bid envelope. It is the bidder’s responsibility to see that their proposals arrive on time. Late proposals, telegram, facsimile or telephones bids shall not be considered.

Each bid shall be accompanied by a detailed description of the apparatus and equipment it proposes to furnish. It is the intent of these specifications to cover the furnishing and delivery of a complete and soundly engineered apparatus equipped as specified. Minor details of construction and materials, where not otherwise specified, are left to the discretion of the contractor, who shall be solely responsible for the design and construction of all features.

Brand names or model numbers have been specified for some items. These have been carefully selected because of their reliability and availability for replacement locally. In order to be most responsive, items named, or an item "equal to" the particular item specified by brand name or model, should be contained in the bid proposal. It is the bidder's responsibility to prove to the Maple Ave Fire Company that an item bid as "equal to" a particular specified item, is truly of equal quality, design, and function. The Greenfield Fire District maintains the right to make a final decision as to the acceptability of an item bid as "equal to" a particular specified item.

No exception shall be allowed for any of the aforementioned instructions. Bids not submitted in accordance with these instructions shall be rejected.

TIMELY PROPOSALS

It is the bidder's responsibility to see that their proposals arrive on time. Late proposals, facsimiles, telegrams, or telephone bids shall not be considered.

GENERAL CONSTRUCTION

The complete apparatus, assemblies, subassemblies, component parts, etc., shall be designed and constructed with the due consideration to the nature and distribution of the load to be sustained and to the general character of the service to which the apparatus is to be subject. All parts of the apparatus shall be designed with a factor of safety, which is equal to or greater than that which is considered standard and acceptable for this class of equipment in fire fighting service. All parts of the apparatus shall be strong enough to withstand general service under full load. The apparatus shall be so designed that the various parts and readily accessible for lubrication, inspection, adjustment and repair. Bidder's specifications must meet minimum requirements of N.F.P.A. Pamphlet #1901; Underwriters Laboratories, Inc.; and all State and Federal Department of Transportation vehicle regulations at time of sale of unit.

The apparatus shall be designed and constructed, and the equipment so mounted, with due consideration to distribution of the load between front and rear axle that all specified equipment, including a full complement of specified ground ladders, full water tank, loose equipment, and firefighters shall be carried without overloading or injuring the apparatus.

PRODUCT LIABILITY INSURANCE

Each bidder shall supply proof of product liability and facility insurance equal to or exceeding $30,000,000.00. This shall be provided as part of the proposal. NO EXCEPTIONS

SINGLE-LINE RESPONSIBILITY

Since the Greenfield Fire District desires to eliminate divided responsibility on the part of the manufacturers, only manufacturers who build their own fire apparatus cab, chassis, body and aerial device shall be considered. The apparatus must be built and painted in a facility owned and operated by the bidder by a staff that is directly employed by the bidder. At least fifteen similar units must have been sold and delivered of the type described herein. The entire apparatus (to include cab, chassis, body, pump, water tank and aerial device) MUST be manufactured in the United States. NO EXCEPTION

The bidder shall state if single line responsibility is being proposed.

Yes/No: _____

SERVICE CENTER AND PARTS DEPOT

The successful bidder shall have an authorized factory service center, with a staff of factory-trained mechanics, well versed in all aspects of service for all major components, of the apparatus within a 40-mile radius of the Maple Ave Fire Company. In addition, the bidder shall maintain a separate service facility at the manufacturing site, in order to satisfy the need for possible major emergency service work.

SPECIAL CONDITIONS

No bid shall be considered unless the bidder can meet the special conditions stated herein.

The complete apparatus must be manufactured in the United States of America.

PRICES AND PAYMENTS

The bid price shall be F.O.B. Destination, on a delivered and accepted basis at the Fire Department.

Total price on bidder's proposal sheet must include all items listed in these specifications. Listing any items contained in the specification as an extra cost item, unless specifically requested to do so in these specifications, shall automatically be cause for rejection.

Bidder shall compute pricing less federal and state taxes. It is understood that any applicable taxes shall be added to the proposed prices, unless the purchaser furnishes appropriate tax-exempt forms.

BID EVALUATION

Maple Ave Truck Committee, Greenfield District Truck Committee and Greenfield Fire District Board of Fire Commissioners shall evaluate bids received. This evaluation shall be based as a minimum on the following criteria:

- Commitment for expedient delivery.
- Commitment to the general conditions contained herein, including warranty.
- Completeness of the proposal, i.e. the degree that it responds to all requirements and requests for information contained here in.
- Manufacturing and delivery schedule.
- Contractor's demonstrated capabilities and qualifications.
- Equipment suppliers and/or local representative's demonstrated capabilities and qualifications.

EXCEPTIONS TO SPECIFICATIONS

Exceptions shall be referenced to the paragraph and page of these specifications where the item appears. Drawings, photographs, and technical information about the exception shall be included as necessary. Any exceptions may be considered during the evaluation process, and the decision shall be final.

Proposals taking total exceptions to specifications shall not be accepted.

"OR APPROVED EQUAL" CLAUSE

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

The result of that demonstration and evaluation shall be of prime importance in the recommendation to the governing body for the final contract award.

TECHNICAL INFORMATION

Bidder shall furnish free of charge, upon request, technical information, graphs, charts, photographs, engineering diagrams, steering geometry, drive train certifications, instruction guides, or other documentation as requested to show that the equipment offered fully complies with these specifications.

PROPRIETARY PARTS

It is the intention of the Purchaser for all bidder's to furnish the apparatus with major parts commonly used by the heavy-duty truck manufacturers and open market vendors where as replacement parts are more readily available and at reduced cost. The use of proprietary parts such as but not limited to axles, suspensions, engines, transmissions, frontal air bags, electronic controls, multiplexing systems, seats, pumps, gauges, foam systems, etc., may not be acceptable by the purchaser. NO EXCEPTION

DELIVERY TIME

Each bidder shall state the completed apparatus delivery time based on the number of calendar days, starting from the date the sales contract is signed and accepted by the apparatus manufacturer. Due to funding, delivery shall not occur prior to March 2012.

Delivery Time:_____ Calendar days

BOND REQUIREMENTS

Any bonds or sureties (bid, performance, or other) required by the Purchasing Organization shall be as specified below or as requested in the advertised "Bid Notice".

A bid bond shall be submitted with the bidder's proposal. The bond shall be for an amount equal to 10% of the proposed bid price. Failure to provide an original, acceptable, valid bid bond with the proposal shall result in the immediate rejection of the bidder's proposal.

The apparatus manufacturer must provide all bonds; bonds provided by a sales representative, dealer, distributor, or agent of the apparatus manufacturer are not acceptable.

With respect to the qualifications of proposed bonds or sureties, the bidder's bonding company must meet the following requirements:

- An acceptable surety as outlined by the department of treasury on their most recent federal register at a limit of at least $10,000,000;
- A.M. Best rating of "A" or better with a financial rating of at least "VIII"; and licensed as a surety in the state where the sale is to be made.

PERFORMANCE BOND

A performance bond shall be supplied by the successful bidder upon acceptance of the signed sales contract for the apparatus. The performance bond shall be for an amount equal to the full contract price (i.e. 100% bond).

NON-COLLUSIVE BIDDING CERTIFICATION

By submission of this bid, each bidder and each person signing on behalf of any bidder, certifies, and in the case of a joint bid, each party thereof certifies as to its own organization, under penalty of perjury, that to the best of their knowledge and belief:

- The prices in this bid have been arrived at independently without collusion, consultation, communication, or agreement, for purpose of restricting competition, as to any matter relating to sale price with any other bidder or any competitor.
- Unless otherwise required by law, the prices that have been quoted in this bid have not been knowingly disclosed by the bidder and shall not knowingly be disclosed by the bidder prior to opening, directly or indirectly, to any other bidder or to any competitor.
- No attempt has been made by the bidder to induce any other person, partnership, or corporation to submit or not to submit a bid for the purpose of restricting competition.
- That all requirements of the law including amendatory provisions as to non-collusive bidding have been complied with.

MATERIAL AND WORKMANSHIP

All equipment furnished shall be guaranteed to be new and of current manufacture, to meet all requirements of these specifications.

All workmanship shall be of high quality and accomplished in a professional manner so as to insure a functional apparatus with a pleasing, aesthetic appearance.

CONTRACT AWARD

The Purchaser reserves the right to reject any or all bids deemed to be unresponsive. The Purchaser also reserves the right to waive any informalities, irregularities and technicalities in procedure.

The Purchaser reserves the right, before awarding the contract, to require a bidder to submit evidence of his qualifications as may be deemed necessary. Documentation, which may be required, is financial soundness, technical competency, and other pertinent qualifications of a bidder, including past performance (experience) with the Purchaser.

Upon award of contract, the sales contract shall be between the Purchaser and the manufacturer of the apparatus. Contracts between the Purchaser and a sales representative, dealer, distributor, or agent of the apparatus manufacturer shall not be acceptable. (No Exceptions.)

SALES ENGINEER

The successful bidder shall designate an individual to perform the contractor's sales engineer functions. The sales engineer shall provide a single point interface between the purchaser and the contractor on all matters concerning the contract.

APPROVAL DRAWING

A detailed drawing of the apparatus shall be provided to the purchaser for approval before construction begins. A copy of this drawing shall also be provided to the manufacturer's representative. Upon purchaser's approval, the finalized drawing shall become a part of the total contract.

The drawing shall show, but is not limited to, such items as the chassis make and model, major components, location of lights, sirens, all compartment locations and dimensions, special suctions, discharges, etc. The drawing shall be a visual interpretation of the apparatus as it is to be supplied.

INSPECTION VISITS

The successful bidder shall facilitate three (3) factory inspection trips to the apparatus manufacturer's facility. Transportation, meals, lodging, and other requisite expenses shall be the responsibility of the Greenfield Fire District.

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

- Pre-construction / blueprint review.
- Mid point completion of entire apparatus.
- Final inspection upon completion.

The Greenfield Fire District, Maple Ave Fire Company maintains the right to inspect the apparatus, within normal business hours, at any other point during construction. Expenses incurred

during non-specified inspection visits shall be the responsibility of the purchaser.

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

DELIVERY, DELIVERY ENGINEER, AND TESTING

Delivery of the apparatus to the Maple Ave Fire Company shall remain the bidder's responsibility.

On initial delivery of the fire apparatus, a qualified and responsible representative of the contractor shall demonstrate the apparatus and provide initial instruction to representatives of the customer regarding the operation, care, and maintenance of the apparatus and equipment supplied.

INSTRUCTION MANUALS/DRAWINGS, SCHEMATIC

In accordance with standard commercial practices, applicable to each vehicle (including body and special equipment) furnished under the contract, the following listed manuals and schematics, in the quantity specified, shall be provided at time of delivery of each vehicle.

The contractor shall supply at time of delivery, two (2) copies of a complete operation and service manual covering the complete apparatus as delivered and accepted.

The manual shall contain the following:

- Descriptions, specifications, and ratings of chassis, pump (if applicable), and aerial device (if applicable).
- Wiring diagrams.
- Lubrication charts.
- Operating instructions for the chassis, any major components such as a pump and any auxiliary systems.
- Instructions regarding the frequency and procedures recommended for maintenance.
- Parts replacement information.

"AS BUILT" WIRING SCHEMATICS

In accordance with standard commercial practices, the manufacturer shall supply two (2) copies of "AS BUILT" wiring schematics/diagrams for the entire vehicle at the time of delivery.

VEHICLE FLUIDS PLATE

As required by NFPA-1901, the contractor shall affix a permanent plate in the driver's compartment specifying the quantity and type of the following fluids used in the vehicle:

A permanent plate in the driving compartment shall specify the quantity and type of the following fluids used in the vehicle:

- Engine oil
- Engine coolant
- Chassis transmission fluid
- Pump transmission lubrication fluid
- Pump primer fluid
- Drive axle(s) lubrication fluid
- Air-conditioning refrigerant
- Air-conditioning lubrication oil
- Power steering fluid
- Cab tilt mechanism
- Transfer case fluid
- Equipment rack fluid
- Air compressor system lubricant
- Generator system lubricant
- Aerial systems

PRINCIPLE APPARATUS DIMENSIONS & G.V.W.R.

The bidder shall include the principle dimensions, front G.A.W.R., rear G.A.W.R., and total G.V.W.R. of the proposed apparatus. Additionally, the bidder shall provide a weight distribution of the fully loaded, completed vehicle; this shall include a filled water tank, specified hose load, miscellaneous equipment allowance in accordance with NFPA-1901 requirements, and an equivalent personnel load of 250 lbs. per seating position.

BIDDER TO SUPPLY AND FILL- IN PROPOSED DIMENSIONS:

- OVERALL LENGTH: _____"
- OVERALL WIDTH: _____"
- OVERALL HEIGHT: _____"
- WHEELBASE: _____"

The axle and total weight ratings of the completed apparatus shall not be less than the following minimum acceptable weight ratings, bidders to supply the following:

- MINIMUM FRONT G.A.W.R.: _____
- MINIMUM REAR G.A.W.R.: _____
- MINIMUM TOTAL G.V.W.R.: _____

PRIMARY PLANT CONSTRUCTION

In order to insure top quality construction, maximum assembly line and engineering communication and the highest level of manufacturing supervision the entire apparatus shall be built at the bidder's primary (headquarters) manufacturing facility. Apparatus constructed at satellite plants will

not be considered.

REQUIRED PROPOSAL BLUEPRINT

A scale drawing of the specific apparatus being proposed shall be submitted WITH THE BID. Drawings of similar units or demo units shall not be permitted. Bidders should be clear that this provision is requiring a SCALE drawing of the truck which is actually being bid. The drawing shall be done at the manufacturer's facility by the manufacturer's engineering department in order to guarantee the accuracy of the drawing. Failure to comply with this requirement shall be grounds for rejection of the bid!

BODY CONSTRUCTION LIMITATIONS

Apparatus bodies which are either bolted together or make excessive use of adhesives shall not be considered. Similarly, body construction techniques which rely upon space consuming extrusions for structural support shall not be permitted.

FAMA COMPLIANCE

The apparatus manufacturer must be a current member of the Fire Apparatus Manufacturer's Association (FAMA).

U.S.A. MANUFACTURER

The entire apparatus shall be assembled within the borders of the Continental United States to insure more readily available parts (without added costs and delays caused by tariffs and customs) and service.

QUALITY MANAGEMENT

The manufacturer shall operate a Quality Management System under the requirements of MIL-I-45208A, a military specification for a quality inspection system established to substantiate product conformance to drawings, specifications, and contract requirements. A copy of the certificate of compliance will be included in the bid.

STEPPING, STANDING, & WALKING SURFACES

All stepping, standing, and walking surfaces on the body shall meet NFPA #1901 anti-slip standards. Aluminum tread plate utilized for stepping, standing, and walking surfaces shall be Alcoa No-Slip type. This material shall be certified to meet the NFPA #1901 standard. Upon request by the purchaser, the manufacturer shall supply proof of compliance with this requirement. All vertical surfaces on the body, which incorporate aluminum tread plate material, will utilize the same material pattern to provide a consistent overall appearance. NO EXCEPTIONS!

AMP DRAW REPORT

The bidder shall provide with their bid proposal and at the time of delivery, an itemized print out of the expected amp draw of the entire vehicle's electrical system.

A written load analysis, which shall include the following:

- The rating of the alternator.
- The minimum continuous load of each component that is specified per: Applicable NFPA-1901.
- Additional loads that, when added to the minimum continuous load, determine the total connected load.
- Each individual intermittent load.

All of the above listed items shall be provided by the bidder per the applicable NFPA-1901.

COOPERATIVE PURCHASING

The Manufacturer shall be pleased to allow other public agencies to use the purchase agreement resulting from this invitation to bid unless the bidder expressly notes on the proposal form that prices are not available for tag-on. The condition of such use by other agencies shall be that any such agency must make and pursue contact, purchase order/contract, and all contractual remedies with the successful bidder. Such tag-ons shall be done so that the original purchasing agency has no responsibility for performance by either the manufacturer or the agency using the contract.

UNDERWRITERS LABORATORIES INC. (UL) EXAMINATION AND TEST PROPOSAL

If required by the specific chapters of NFPA-1901, the proposed unit shall be tested and certified by Underwriters Laboratories Inc. (UL) Underwriters Laboratories Inc. (UL) is recognized worldwide as a leading third party product safety certification organization for over 100 years. UL has served on National Fire Protection Association (NFPA) technical committees for over thirty years.

INDEPENDENT TESTING ORGANIZATION QUALIFICATIONS

- UL is a nationally recognized testing laboratory recognized by OSHA.
- UL complies with the American Society for Testing and Materials (ASTM) Standard ASTM E543 "Determining the Qualifications for Nondestructive Testing Agencies."
- UL has more than 40 years of automotive fire apparatus safety testing experience and 16 years of factory aerial device testing and Certification experience. UL has more than 100 years of experience developing and implementing product safety standards.
- UL does not represent, is not associated with, nor is in the manufacture or repair of automotive fire apparatus.
- All test work for fire pumps outlined in NFPA 1901, Edition shall be conducted.
- UL has included a list of all factory aerial device manufacturers for whom testing is currently being conducted on a regular basis.
- UL carries ten million dollars in excess liability insurance for bodily injury and properly damage combined.

UL provides the manufacturer a complete written examination and test report for each inspection

performed at the manufacturer's facility. This report specifies the points of inspection and results of such examinations and tests.

PERSONNEL

The UL inspectors performing the test work on the units are certified to Level II in the required NDT methods, under the requirements outlined in ASNT document CP-189.

The actual person(s) performing the inspection shall present for review proof of Level II Certification in the required NDT methods.

Prior to submittal to the automotive fire apparatus manufacturer, the final Report shall be reviewed by the Supervisor of Fire Equipment Services and a Registered Professional Engineer, both of whom are directly involved with the aerial device certification program at UL.

GENERAL APPARATUS DESCRIPTION "PUMPER"

The unit shall be designed to conform fully to the "Pumper Fire Apparatus" requirements as stated in the NFPA 1901 Standard (2009 Revision), which shall include the following required chapters as stated in this revision:

- Chapter 1 Administration
- Chapter 2 Referenced Publications
- Chapter 3 Definitions
- Chapter 4 General Requirements
- Chapter 5 Pumper Fire Apparatus
- Chapter 12 Chassis and Vehicle Components
- Chapter 13 Low Voltage Electrical Systems and Warning Devices
- Chapter 14 Driving and Crew Areas
- Chapter 15 Body, Compartments and Equipment Mounting
- Chapter 16 Fire Pumps and Associated Equipment
- Chapter 18 Water Tanks

CAB SAFETY SIGNS

The following safety signs shall be provided in the cab:

- A label displaying the maximum number of personnel the vehicle is designed to carry shall be visible to the driver.
- “Occupants must be seated and belted when apparatus is in motion” signs shall be visible from each seat.
- “Do Not Move Apparatus When Light Is On” sign adjacent to the warning light indicating a hazard if the apparatus is moved (as described in subsequent section).
- A label displaying the height, length, and GVWR of the vehicle shall be visible to driver.
- This label shall indicate that the fire department must revise the dimension if vehicle height changes while vehicle is in service.

CHASSIS DATA LABELS

The following information shall be on labels affixed to the vehicle:

Fluid Data

- Engine Oil
- Engine Coolant
- Chassis Transmission Fluid
- Pump Transmission Lubrication Fluid
- Pump Primer Fluid (if applicable)
- Drive Axle(s) Lubrication Fluid
- Air Conditioning Refrigerant
- Air Conditioning Lubrication Oil
- Power Steering Fluid
- Cab Tilt Mechanism Fluid
- Transfer Case Fluid (if applicable)
- Equipment Rack Fluid (if applicable)
- Air Compressor System Lubricant
- Generator System Lubricant (if applicable)
- Front Tire Cold Pressure
- Rear Tire Cold Pressure
- Aerial Hydraulic Fluid (if applicable)
- Maximum Tire Speed Rating

Chassis Data

- Chassis Manufacturer
- Production Number
- Year Built
- Month Manufactured
- Vehicle Identification Number

Manufacturers weight certification:

- Gross Vehicle (or Combination) Weight Rating (GVWR or GCWR)
- Gross Axle Weight Rating, Front
- Gross Axle Weight Rating, Rear

ROLLOVER STABILITY

The apparatus shall meet the criteria defined in 4.13.1 for rollover stability as defined in the 2009 NFPA Standard for Automotive Fire Apparatus.

****** CAB AND CHASSIS ******

"PREDATOR" CAB TYPE OR EQUIVALENT

- **FULL TILT**
- **CONTOUR WINDSHIELD**

The cab shall be a custom tilt style, built specifically for fire service. The cab shall be a cab over engine design, with integral tilt mechanism and engine access from inside the cab.

Cab shall be designed, fabricated, assembled in its entirety, and installed on the frame rails in the factory of the bidder. This requirement shall eliminate any split responsibility in warranty and service. NO EXCEPTIONS

OPEN SPACE DESIGN

The cab interior shall be the "Open-Space" design with no wall, support posts or window between the front and rear crew area to allow direct communication, better visibility and air circulation in the cab.

CAB MATERIAL

The cab shall be fabricated from 5052-H 32 aluminum alloy, utilizing the minimum material thickness as follows:

- Cab side panels 0.125 thick (1/8")
- Cab roof 0.125 thick (1/8")
- Forward cab front sheet 0.125 thick (1/8")
- Interior cab panels 0.125 thick (1/8")
- Other panels 0.125 thick (1/8")
- Cab doors 0.1875 thick (3/16")
- Engine enclosure side panels 0.250 thick (1/4")

CAB - BASE CONSTRUCTION

Cab sub-frame shall be a welded assembly fabricated of 6063 structural aluminum alloy. This frame shall extend the full length and width of the cab and be secured to the chassis frame through two (2) rear urethane self centering load cushions, two (2) forward pivot brackets, and two (2) cab locks. The cab shall be of entirely welded construction.

The front cab wall shall be of double wall type construction, featuring an inner and outer panel. NO EXCEPTIONS

CRASH TESTING CERTIFICATION

To ensure the safety of the cab occupants and cab integrity, proof of third party testing shall be provided. The cab shall be certified for SAEJ2422 side impact, SAEJ2420 with ECER29 cab front impact, and ECER29 cab roof strength. NO EXCEPTIONS

DIMENSIONS - EXTENDED LONG FOUR DOOR STYLE CAB

Minimum Cab Dimensions:

• Overall width	100"
• Inside width across ceiling	92"
• Front area floor to ceiling	63"
• Top of front seat to ceiling	44" (depending upon seat type)
• Seat back to steering wheel	22" (depending upon seat type)
• Inside width (door to engine enclosure)	25" (driver's side, at floor)
• Inside width (door to engine enclosure)	22-1/2" (officer's side, at floor)
• Crew seat area width	92"
• Outer crew seat risers to rear wall	64-1/2"
• Centerline axle to rear wall	82-1/2"
• Rear of engine enclosure to rear cab wall	65"
• Floor to top of engine enclosure	30"
• Centerline axle to front of cab	74"

Glass Area Dimensions:

• Windshield (Contour)	3,422 sq. in.
• Front door window, retractable	743 sq. in. each
• Rear door window, retractable	875 sq. in. each
• Side fixed crew windows	620 sq. in. each

Cab Entry Door Dimensions

• Forward door opening	74-1/4" high x 40" wide
• Forward door recessed step	30" wide by 9" deep
• Rear door opening	90-1/4" high x 37" wide
• Rear door recessed step	29" wide x 9" deep

CAB ROOF

The roof shall be of a split level design with radius edges for an aesthetic, streamline appearance. The roof shall be constructed the same material as the main structure and shall be internally reinforced using framing which shall span the entire width and length of the cab for maximum structural integrity. This shall allow the roof to support personnel and roof mounted equipment without the need for additional reinforcement.

The cab roof over the rear crew area shall be raised sixteen (16) inches higher than the front driver and officer area. The front face of the raised roof section shall be sloped at a 45 degree angle, creating a streamlined interface with the standard, lower, forward roof section. This design shall allow for additional interior height in the rear crew area.

The rear crew area doors shall be "Vista-Style", extending full height to the radius edge of the raised roof.

Approximate dimensions:

- Crew area floor to ceiling 70"
- Top of crew seat to ceiling 52" (depending upon seat type)

CAB ROOF OVERLAY

The cab roof area below the light tower shall be overlaid with minimum 1/8" bright finish aluminum tread plate.

CAB DOORS

Four (4) side-opening doors shall be provided. The cab doors shall be totally aluminum construction with an extruded aluminum frame and a 3/16" thick aluminum outer door skin. Doors shall be full height from the step to the cab roof extrusion and enclose the step area when the doors are closed.

The forward cab door opening shall be a minimum of 40" wide, and the rear cab door opening shall be a minimum of 37" wide. The rearward cab doors shall have a radius cutout allowing the door opening to protrude forward over the cab wheel well, while providing full access to the rear crew area.

There shall be a heavy duty piano type stainless steel hinge on each door with a minimum pin diameter of 5/16". Hinges shall be slotted for ease of horizontal and vertical adjustment. There shall be a cab door seal and the doors shall close flush with the side of the cab. A heavy-duty 2 1/2" wide reinforced rubber strap shall be utilized to prevent the cab doors from opening greater than 90 degrees.

ENTRY STEP AREA

Each of the forward entrance steps shall be a minimum of 8-1/2" deep x 30" wide with the floor board recessed a minimum of 5" to avoid "shin knocking". Each step shall be a bolt-in cast aluminum step. The cab steps risers shall be overlaid with bright finish aluminum tread plate.

Each of the rear entrance steps shall be a minimum of 8-1/2" deep x 30" wide. An intermediate step shall be provided between the lower entrance step and the crew area floor for ease of entry and egress. Each upper section of the steps and respective step risers shall be constructed as an integral part of the cab construction and shall be overlaid with bright finish aluminum tread plate. Each lower step shall be a bolt-in cast aluminum step.

DOOR LATCHES

Chrome plated “D” ring pull handles shall be provided on the exterior of each cab door. Heavy-duty, bright finish cast paddle latches shall be provided on the interior of each cab door. Door latch mechanisms which utilize spring steel clamps shall not be considered due to their tendency to both rust and break. The interior door latch cables are to be designed to reduce adjustment or possible wear at the adjustment turnbuckles.

Each exterior cab door shall be equipped with keyed locks. The cab doors shall be capable of being locked from the outside with a key and from the inside with a control in each interior paddle latch.

DOOR WINDOWS

Each side cab door shall have a tinted retractable window operated by a hand crank mechanism. The window track shall be designed into the door frame extrusion, which shall be extruded with a track groove to house a window track and seal. The window shall be capable of being removed from an access slot designed in the bottom of the door frame.

Each side cab door window shall be designed with a custom extruded trim plate, which shall conform to the perimeter of the window opening in each door. The trim plate shall extend from the edge of the door skin to the window and shall have a silver anodized finish.

INNER DOOR PANELS

The upper section of each cab door interior shall have a formed ABS door panel, which shall be vacuum overlaid with a soft vinyl upholstery material. The color of the panel upholstery shall be gray. The ABS door panels shall terminate approximately ten (10) inches above the cab floor.

DOOR SCUFF PLATES

The lower and full width portion of each door interior shall have smooth brushed finished aluminum scuff plates to provide maximum wear protection. These plates shall extend above the inside cab floor level when the doors are closed.

Each interior cab door panel shall be equipped with reflective ScotchLite material that shall cover at least 96 in^2.

EXTERIOR CAB TRIM

A high luster stainless steel trim band shall be provided along the cab sides at 11.5” in height. Black vinyl trim molding shall be installed along the top and bottom of the trim band.

EXTERIOR CAB TRIM

A high luster 6" stainless steel trim band shall be provided along the cab sides, centered on the doors as directed by the fire department. The trim band shall extend from the headlight assemblies to the rear edge of the cab. Black vinyl trim molding shall be installed along the top and bottom edges of the trim band.

TRANSVERSE EXTERIOR CAB COMPARTMENTS

Two (2) compartments shall be provided, to the rear of the crew cab doors. The compartments shall be as large as possible, approximately 38" high, 16" wide and 27 3/4" deep in the lower area and transverse above the frame rails. The transverse section shall be approximately 20" wide x 18" high. The

transverse section shall be designed to be capable of being utilized for a seat riser. To make the compartment accessible from inside the crew area the front wall of the transverse section shall be with two (2) flat panel drop down doors.

The exposed section of the compartment in the rear crew area shall be painted with a textured paint to match the cab interior. The interior of the compartment shall be painted to match the color or material provided in the body compartments.

Compartment door shall be Robinson Brand roll up doors with a brushed aluminum finish. Each compartment shall contain a flush mounted LED light strip for illumination of the compartment and shall be wired to a door jamb switch to automatically come on when the door is opened.

SCUFF PLATE

Each exterior cab compartment door shall be equipped with a 14 gauge brushed stainless steel inner door pan, full width, full height of the door pan.

AIR CYLINDER RACK

An air cylinder storage rack shall be provided in the driver's side exterior cab compartment. This rack shall be capable of storing at least two (2) SCBA cylinders.

AIR CYLINDER RACK

An air cylinder storage rack shall be provided in the officer's side exterior cab compartment. This rack shall be capable of storing at least two (2) SCBA cylinders.

WINDSHIELD/GLASS

A one piece, symmetrical, safety glass windshield shall be provided on the cab for the driver and officer providing a clear viewing area. The windshields shall be full width to the center of the front cab support for each side and provide the occupants with a panoramic view. To provide enhanced peripheral vision on each side of the cab, the windshield and cab structure shall be designed with radius corners, which provide a minimum of 8" of glass area, measured from the glass face to the side edge near the door post. The windshield shall consist of three (3) layers; the outer light, the middle safety laminate and the inner light. The thick outer light layer shall provide superior chip resistance, the middle safety laminate layer shall prevent the windshield glass pieces from detaching in the event of breakage and the inner light shall provide yet another chip resistant layer.

The windshield will be a contour design with 3422 sq. in. of area for improved visibility and style. The windshield glass shall be designed so it can be used on either the driver or officer side. Windshields that utilize epoxy or that are bonded to the cab structure will not be acceptable.

WINDSHIELD WIPERS AND WASHER

Dual, electric operated, pantographic type windshield wipers shall be provided. One (1) electric drive motor must be provided for each wiper. Windshield wiper systems which utilize a single motor and a reciprocating actuator arm shall not be considered.

Wipers shall have "HI/LO" and "INTERMITTENT" operating speeds. "HI/LO" speeds shall be controlled by a steering column control, within the turn signal control stem. "INTERMITTENT" operation shall be controlled by a twist switch within the control on the steering column. The wipers shall be of the self-parking type.

Windshield washers shall be electric operated wet-arm type with a 3/4 gallon washer fluid reservoir, mounted inside the engine enclosure and readily accessible through the engine hatch at the rear of the engine enclosure. The washer control shall be integral with the intermittent wiper control switch.

There shall be individual removable panels on the front face of the cab for access to the wiper motor assemblies.

CAB SIDE VIEWING WINDOWS

A fixed, tinted window with 620 sq. in of glass area shall be provided on each side of the cab behind the forward cab doors. This window shall be the same height as the window in the rear cab door for maximum visibility.

DARK TINTED REAR WINDOW GLASS

The windshield and the forward cab door glass shall be provided with standard DOT green automotive tint. The side cab windows to the rear of the front doors, the rear cab door windows and any rear viewing windows shall be equipped with a dark automotive tint. The use of stick on material shall not be acceptable.

GRAB HANDLES

Four (4) 1-1/4" diameter x 28" long, knurled, bright anodized aluminum handrails shall be provided, one (1) at each cab door entrance. Grab rail stanchions shall be chrome plated and offset when necessary to prevent "hand-pinching" when opening or closing the doors. Formed rubber gaskets shall be provided between each stanchion base and the cab surface.

INTERIOR GRAB RAILS

Three (3) vertically mounted 12” black cast aluminum “D” style entry assist handles shall be installed, one (1) on the officer’s side of the cab interior “A” post and one (1) on each side of the cab interior on the “C” post in the crew area to assist in entry and exiting of the cab.

Each front cab door shall be provided with one (1) horizontally mounted, "D" style entry assist handle on the interior door panel to assist in entry and exiting of the cab and for closing the door.

Each rear cab door shall be provided with one (1) horizontally mounted, "D" style entry assist handle on the interior door panel to assist in entry and exiting of the cab and for closing the door. Each rear cab door shall also be provided with one (1) horizontally mounted, 30" long black cast aluminum "D" style assist handle, located approximately 8" above the bottom of the window opening.

AIR INTAKE/OUTLET

There shall be a bright finished front air intake for maximum air flow to the charge air cooler and the radiator.

Two (2) bright finished air inlets/outlets shall be provided horizontally above the wheel well opening, one on each side of the cab. The design shall permit proper ducting of air through the engine compartment and cooling system. The left side inlet, used for the air intake to the air cleaner, shall be equipped with an ember separator for separating water and burning embers from the air intake system. This system shall be such that particles larger than .039 inches (1 mm) in diameter can not reach the air filter element.

WHEEL WELL LINERS

The front cab wheel wells shall be equipped with fully removable, bolt-in, aluminum inner wheel well liners. The liners shall extend full depth into the truck frame. The completely washable wheel well liners shall be designed to protect the cab substructure, inner panels, and other miscellaneous installed components from road salts, debris, dirt accumulation and corrosion. Fender liners which are fixed partially removable or one piece liner/fenderette shall not be considered.

FENDERETTES

The cab wheel well openings shall be trimmed with replaceable, bolt-in, polished aluminum fenderettes. The fenderettes shall be secured to the cab with stainless steel threaded fasteners along the internal perimeter of the wheel well. Rubber welting shall be installed between the fenderettes and the cab side panel.

MUD FLAPS

Heavy duty, black rubber type mud flaps shall be provided behind the front wheels.

CAB MIRRORS

Two (2) Velvac "Super Star" Model 2025 chrome mirrors shall be installed, one (1) on each cab door. Each mirror shall have a 98.7 square inch flat glass viewing area and a 17.8 square inch top hat convex viewing area. Both heads shall be electrically heated and controlled by a switch on the dash convenient to the driver. The flat glass head shall be remotely controlled from the drivers seating position; the convex portion shall be manually adjustable and shall be positioned on top of the mirror assembly. Mirror housing and all mounting brackets have a bright finish.

INTERIOR CAB TRIM

The cab interior shall be constructed to create an ergonomically designed interior to be user friendly and functional for the driver and officer.

The forward overhead panel shall be covered with a three (3) piece custom formed ABS vinyl overlay, which shall have integrated windshield defroster/heat vents.

All ABS formed material panels, as well as all of the interior upholstery panels shall be medium gray in color. The upholstered cab overhead and side wall portions shall utilize gray Durawear upholstery with padding underneath to provide additional insulation.

The interior metal surfaces of the cab shall be finish painted with a textured gray paint.

INTERIOR REAR WALL

The interior rear wall of the cab shall be covered with gray Durawear for durability and shall match the other upholstered areas of the cab.

A twelve (12) inch high bright finish aluminum tread plate scuff plate shall be provided on the lower portion of the rear interior cab wall.

STORAGE COMPARTMENTS

There shall be a compartment provided under each front seat. Each compartment shall be accessible from the side of the seat riser when the door is opened. The compartment under the driver's seat shall measure 13 1/2"W x 16 1/2"D x 7-3/4"H. The compartment under the officer's seat shall measure 13 1/2"W x 13 1/2"D x 7-3/4"H.

BARYFOL FLOORING

The floor of the driver's compartment and the floor of the crew area shall be lined with BARYFOL vinyl composite flooring to comply with NFPA noise and heat requirements.

The material utilized for this application shall be certified to meet the NFPA 1901, 2009 revision for anti slip walking surfaces.

ACOUSTICAL INSULATION

One (1) inch thick acoustical insulation shall be provided on the cab roof and rear and side walls of the cab. This material shall be fitted between the cab structural members and secured with adhesive to provide an insulation barrier for noise and heat.

ENGINE ENCLOSURE

The forward portion of the engine enclosure shall be covered with a vinyl ABS material formed overlay to match the balance of the cab interior. To allow maximum "elbow room" for the driver and officer, the forward portion of the engine enclosure shall feature a contour shape. The engine enclosure shall not significantly obstruct the driver's vision in any direction. The enclosure shall be an integral part of the cab structure, which shall be constructed from .250 5052-H32 aluminum, providing adequate strength to support radio, map boxes, etc. The engine enclosure shall be insulated to protect from heat

and sound. The noise insulation shall keep the DBA level within the limits stated in the current NFPA series 1900 pamphlet.

A padded, hinged access door shall be provided in the top rearward portion of the engine enclosure. The door shall allow access to the engine oil, transmission fluid, power steering fluid level dipsticks and the windshield washer fluid reservoir. The access door shall be provided with two (2) flush mounted latches and gas shock holders. There shall be a gray ABS vinyl cover over the access door to give a cleaner look to the top of the engine enclosure and doghouse area.

SUN VISORS

To provide maximum protection for the driver and officer, two (2) padded sun shall be recess mounted in the cab overhead on each side.

******* CAB SEATING & ACCESSORIES *******

DRIVER'S SEAT

The driver's seat shall be a H. O. Bostrom Sierra EX 8, high back bucket ABTS seat. The seat shall have a tapered and padded seat cushion with lumbar support. The seat shall have an eight inch fore and aft adjustment, a 2 inch height adjustment, front of seat tilt, rear of seat tilt and a reclining seat back. All seat movements shall be electrically controlled from a control panel on the forward lower edge of the seat.

The seat shall be equipped with a red integrated 3-point shoulder harness with lap belt and an automatic retractor built into the seat assembly.

OFFICER'S SEAT

The officer's seat shall be a H. O. Bostrom Tanker 450 ABTS series fixed base high back bucket seat. The seat shall have a tapered and padded seat cushion with lumbar support. The seat shall include a SCBA storage area with integral headrest.

The seat shall be equipped with a red integrated 3-point shoulder harness with lap belt and an automatic retractor built into the seat assembly.

The officer's seat shall include a H. O. BOSTROM Secure All™ SCBA Locking System. The bracket system shall be free of straps and clamps that may interfere with auxiliary equipment on SCBA units. The center guide fork shall keep the tank in-place for a safe and comfortable fit in seat cavity. Fire fighters shall simply push the SCBA unit 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 standard release handle shall be integrated into the seat cushion for quick and easy release and shall eliminate the need for straps or pull cords to interfere with other SCBA equipment.

*******CREW AREA SEATING, X-LFD CAB*******

DRIVER'S SIDE REAR FACING CREW SEAT

The driver's side outboard rear facing crew seat shall be a H. O. Bostrom Tanker 450 ABTS series fixed base high back bucket seat. The seat shall have a tapered and padded seat cushion with lumbar support. The seat shall include a SCBA storage area with integral headrest.

The seat shall be equipped with a red integrated 3-point shoulder harness with lap belt and an automatic retractor built into the seat assembly.

The driver's side rear facing outboard seat shall include a H. O. BOSTROM Secure All™ SCBA Locking System. The bracket system shall be free of straps and clamps that may interfere with auxiliary equipment on SCBA units. The center guide fork shall keep the tank in-place for a safe and comfortable fit in seat cavity. Fire fighters shall simply push the SCBA unit 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 standard release handle shall be integrated into the seat cushion for quick and easy release and shall eliminate the need for straps or pull cords to interfere with other SCBA equipment.

OFFICER'S SIDE REAR FACING CREW SEAT

The officer's side outboard rear facing crew seat shall be a H. O. Bostrom Tanker 450 ABTS series fixed base high back bucket seat. The seat shall have a tapered and padded seat cushion with lumbar support. The seat shall include a SCBA storage area with integral headrest.

The seat shall be equipped with a red integrated 3-point shoulder harness with lap belt and an automatic retractor built into the seat assembly.

The officer's side rear facing outboard seat shall include a H. O. BOSTROM Secure All™ SCBA Locking System. The bracket system shall be free of straps and clamps that may interfere with auxiliary equipment on SCBA units. The center guide fork shall keep the tank in-place for a safe and comfortable fit in seat cavity. Fire fighters shall simply push the SCBA unit 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 standard release handle shall be integrated into the seat cushion for quick and easy release and shall eliminate the need for straps or pull cords to interfere with other SCBA equipment.

DRIVER'S SIDE FORWARD FACING CREW SEAT

The driver's side outboard forward facing crew seat shall be an H. O. Bostrom Tanker 450 ABTS series fixed high back bucket seat. The seat shall have a tapered and padded seat cushion with lumbar support. The seat shall include an SCBA storage area with integral headrest.

The seat shall be equipped with a red integrated 3-point shoulder harness with lap belt and an automatic retractor built into the seat assembly.

The driver's side outboard forward facing crew seat shall have a standard seat base.

The driver's side forward facing outboard seat shall include a H. O. BOSTROM Secure All™ SCBA Locking System. The bracket system shall be free of straps and clamps that may interfere with auxiliary equipment on SCBA units. The center guide fork shall keep the tank in-place for a safe and comfortable fit in seat cavity. Fire fighters shall simply push the SCBA unit 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 standard release handle shall be integrated into the seat cushion for quick and easy release and shall eliminate the need for straps or pull cords to interfere with other SCBA equipment.

OFFICER'S SIDE FORWARD FACING CREW SEAT

The officer's side outboard forward facing crew seat shall be an H. O. Bostrom Tanker 450 ABTS series fixed high back bucket seat. The seat shall have a tapered and padded seat cushion with lumbar support. The seat shall include an SCBA storage area with integral headrest.

The seat shall be equipped with a red integrated 3-point shoulder harness with lap belt and an automatic retractor built into the seat assembly.

The officer's side outboard forward facing crew seat shall have a standard seat base.

The officer's side forward facing outboard seat shall include a H. O. BOSTROM Secure All™ SCBA Locking System. The bracket system shall be free of straps and clamps that may interfere with auxiliary equipment on SCBA units. The center guide fork shall keep the tank in-place for a safe and comfortable fit in seat cavity. Fire fighters shall simply push the SCBA unit 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 standard release handle shall be integrated into the seat cushion for quick and easy release and shall eliminate the need for straps or pull cords to interfere with other SCBA equipment.

SEAT UPHOLSTERY MATERIAL

The seats shall be upholstered with heavy duty gray tweed Durawear material as provided by Bostrom.

PADDED SCBA OPENING COVERS

Removable padded covers shall be provided for the SCBA seat openings.

SEAT BELT CUSHION SENSORS AND BELT SENSORS

The apparatus shall be equipped with an IMMI seat belt warning system. The system shall consist of a Seat Belt module, dash mounted display and an audible alarm.

Seat belt and seat cushion sensors shall be provided on the six (6) specified seating positions.

VEHICLE DATA RECORDER

An IMMI Vehicle Data Recorder (VDR) system shall be provided. The system shall include an NFPA compliant "Black Box" with reporting software that shall be capable of data storage to coincide with the NFPA requirements.

Data storage capabilities shall include interfaces with the following systems:

- Display module (Master Optical Warning Device)
- Seat belt monitoring (seat occupied with seat belt)
- Surface or panel mount
- VDR, date & time stamp
- Max Vehicle speed (MPH)
- Vehicle acceleration / deceleration (MPH/Sec.)
- Engine Speed (RPM)
- ABS event
- Data password protected
- Data sampled once per second, in 48-hour loop
- Data sampled min by min for 100 engine hours
- Throttle position (% of Throttle)
- Data software
- Data interface for data download
- PC / Mac Compatible
- Hours Driven
- Data summary reports
- Last Minute Log
- Idle Time

INTERIOR CAB STORAGE COMPARTMENT

A storage compartment shall be mounted against the rear wall of the cab crew area. The compartment shall be approximately 24" deep x 69" high (depending on roof height) x 36" wide. The door opening shall be approximately 38" high x 26" wide.

The compartment shall be constructed of smooth aluminum and shall be equipped with a roll-up door. The Star of Life shall be applied to the roll up door. The compartment shall be painted with textured paint, matching the interior color of the cab.

Three (3) adjustable shelf(s) shall be provided in the EMS compartment. The shelf(s) shall be constructed from 3/16" brush aluminum mounted to uni-strut tracking material.

The EMS compartment shall be equipped with two (2) Amdor brand LED interior lights. The light(s) shall be wired to automatically activate when the compartment door is open and the master battery switch is in the "on" position.

CAB DOGHOUSE STORAGE MODULE

A storage module shall be installed on the center doghouse area between the driver and officer. The module shall be constructed of 1/8" aluminum and shall be painted with a scuff resistant paint to match the cab interior. The module shall include two (2) cup holders, a pen tray, a flat open storage area for notebooks, six (6) divided storage area's for 3-ring binders, and four (4) slide in storage area's two (2) accessible from each side of the cab.

ANTENNA INSTALLATION

Three (3) antenna mounting base(s) model #MATM with 17' of coaxial cable shall be provided and installed on the lower cab roof, behind the light bar. The attached antenna wire(s) shall be run to the right side cab dash area.

The Fire Department is responsible to have the correct antenna whip installed once the apparatus is delivered.

LAPTOP COMPUTER SLIDE OUT TRAY

A slide out tray shall be installed for the officer to provide an area for laptop computer usage. In the closed position this area will be nest forward to allow access in and out of the vehicle. The computer station shall be capable of holding a Panasonic Toughbook 31 with vehicle charger, GPS and Windows 7 Professional.

******* CAB INSTRUMENTATION & CONTROLS *******

DASH & CENTER CONSOLE

The dash shall be constructed of a vinyl overlaid, ABS custom formed material to create an ergonomically designed interior to be user friendly and functional for the driver and officer. The instrument cluster shall be centered in front of the driver and all gauges shall be fitted in a non-glare panel.

All warning lights and indicators shall be located in either the gauge itself or in the warning light cluster located in the lower center portion of the dash. Each gauge shall be equipped with an international symbol that is easily recognizable, denoting the system being monitored. Instrumentation shall be backlit for easy identification.

The transmission gear selector and the spring brake control valve shall be located on an angled section of the center dash assembly toward the driver for easy access.

There shall be provisions for mounting a switch panel in the center of the dash between the driver and officer. The top center of the dash assembly shall contain one (1) removable panel to access the main chassis wiring circuits and breaker panels.

DRIVERS DASHBOARD PANEL

The main instrument panel shall be centered in front of the driver and shall be mechanically fastened to the main dash assembly. The dash panel shall be 1/8" aluminum with an anti-glare, pewter finish brushed surface. The driver's dashboard panel shall contain the gauge panel along with an instrument warning light cluster.

The main instrument panel shall contain ten (10) primary gauges. An ignition and engine start switch shall be located on main dash panel located in front of the driver.

Each gauge shall have a raised glass lens with polished chrome trim ring and be backlit by integral blue LED's. Each gauge shall be designed with an integral red warning light with a pre-programmed warning point. Gauges monitoring drive-train component status shall be of the direct data bus type capable of displaying information broadcast on the J 1939 data-link. Each gauge warning indicator shall be capable of activating an audible alarm inside the dashboard.

Additional auxiliary control switches and instruments (if applicable) shall be located within the center or overhead panel located near the driver's position.

The ten (10) primary gauges shall consist of:

- Vehicle speedometer (0-80 mph)
- Engine tachometer (0-3000 rpm)
- Engine oil pressure (0-100 psi); low oil pressure warning
- Engine coolant temperature (100-250 °F); high engine temp warning (based on engine)
- Transmission oil temperature (100-350 °F); high transmission fluid temp warning
- Vehicle battery voltage (9-18 VDC); low voltage warning at 11.8 amps
- Front air system gauge (0-150 psi); low air pressure warning at 65 psi
- Rear air system gauge (0-150 psi); low air pressure warning at 65 psi
- Fuel level (E-1/2-F); low fuel level warning @ 1/8 tank
- Air cleaner restriction gauge (0 - 40), warning at 25" restriction.
- Secondary fuel primer control switch
- Engine Compression Brake Controls.
- Class One "Officer's Speedometer" (near officer's seating position).

INDICATOR CLUSTER

The driver's dashboard panel shall consist of Ametek gauges, an 18 item instrument warning light cluster and a 16 item, dead front type alarm panel.

This display shall contain the system control unit that collects data from the vehicle data bus (J1939), analog sensors, and switches throughout the vehicle. This data shall be presented using gauges, telltales and the two (2) display panels. The warning light display shall include a 2 x 20 dot matrix display, 18 telltales and 2 buttons to navigate through the screen menus.

The LCD dot matrix display shall be a 2 line by 20-character display with each character being 7 dot by 5 dot configuration. FSTN technology shall be used on the display for wide viewing capability. The module shall be backlit with amber LED's. The unit shall also be supplied with a heater to ensure proper operation over the entire 40 to +85 deg. C.

Greenfield Fire District
Maple Ave Fire Company
Engine Rescue

This display contains a series of two (2) screens to provide information about the vehicle. To control the display of that information, the screens are divided into two (2) menus; one that can be displayed while the vehicle is in motion and one that can only be accessed when the parking brake is set.

On the Road displays include:

- Two (2) configurable displays that can show any of the parameters the unit collects. This includes odometer, trip information, fuel economy information; all gauge data, and virtually any other data available on the vehicle that the display has access to, either through the data bus or via analog inputs.
- Two (2) trip displays for miles and hours that are capable of being reset.
- Two (2) fuel data screens: shall be provided; one for fuel remaining until empty and one for fuel economy. The fuel economy display shall be capable of being reset so that average economy over a predetermined period can be displayed.

The displays that can be accessed when the parking brake is set include:

- Engine hours as maintained by the engine ECU
- Service Alarm screens to report miles to next service or miles past required service. These screens shall allow the operator to choose the length of the service interval and shall have the ability to reset it.
- Message screens with warning messages the display has collected during the current ignition cycle. These screens shall be divided into configured warnings such as “Low Air Pressure” and the data bus faults reported by ECU's on the vehicle. Both lists shall allow the operator to review the last 12 events that occurred on the vehicle for maintenance and troubleshooting purposes.
- Diagnostic screens shall test the instrumentation system to verify it is working correctly.
- Setup screens shall be used to select either English or metric display. They shall also allow the operator to choose the data that shall be displayed by the configurable on-the-road screens.

The system shall be configured with user defined warning messages such as Low Air Pressure or High Coolant Temperature. When these events occur the warning message shall come up on the screen and can be accompanied by a buzzer. The messages shall be prioritized so the most important messages are always displayed. Whether the message can be dismissed by pressing a button shall be configurable. Messages that have been dismissed but are still active shall be retained in the message screens for review until the ignition is turned off. Listed below are the defined telltales and their indicators.

- "Right And Left Directional" arrows (green in color)
- "Ignition ON" Indicator (amber in color)
- "Hi Beam" indicator (blue in color)
- "Battery ON" indicator (green in color)
- "Parking Brake ON" indicator (red in color)
- "Check Transmission" indicator (amber in color)
- "Cab Not Latched" indicator (red in color)
- "Stop Engine" indicator (red in color)
- "Check Engine" indicator (amber in color)
- "ABS Warning" indicator (red in color)
- "Low Coolant Level" (red in color)
- "Fuel Restriction" indicator (amber in color)

- "Water In Fuel" indicator (amber in color)
- "Fasten Seat Belts" indicator (red in color)
- "Fast Idle" Indicator (amber in color)
- "Do Not Move Truck" indicator (red in color)
- "DPF Regeneration" (amber in color)
- "Exhaust High Temperature" (amber in color)
- "Engine Diagnostic Fault" (amber in color)
- "Retarder On" (green in color)

Listed below are indicators that may be included, depending upon the vehicle configuration:

- "Wait To Start" indicator (amber in color)
- "Exhaust System Fault" (amber in color)
- "Topps System Fault" (amber in color)
- "Lube System Active" (amber in color)
- "Jacks Not Stowed" (red in color)
- "PTO Engaged" (green in color)
- "Inter Axle Lock" (amber in color)
- "4x4" (green in color)
- "Driver Controlled Diff Lock" (green in color)
- "Ok to Pump" (green in color)
- "Auto Traction Control" (amber in color)
- "Retarder Active" (amber in color)
- "Auxiliary Brake Active" (amber in color).
- "ATC Disabled" indicator (red in color)
- "ATC Active" indicator (yellow in color)
- "Low Engine Coolant" indicator light and alarm

LOWER LEFT AUXILIARY SWITCH PANEL

The driver's lower left panel shall be capable of housing five (5) guarded type rocker switches. Examples of the switches that shall be installed in this area are automatic chains, fan clutch override, ATC, inter-axle diff lock, electric fuel pump, all wheel drive, etc.

PUMP SHIFT CONTROL

The pump shift control and pump engaged indicator light shall be mounted in the driver's lower left panel. This control shall be equipped with a mechanical type lock to prevent inadvertent activation or de-activation. The lever positions and indicator light shall be clearly marked.

OFFICER DASH

There shall be a flat surface area in front of the officer.

CENTER OVERHEAD PANEL

An overhead console with a removable pewter panel shall be provided on the cab interior overhead between the driver and officer to permit installation of cab stereo, intercom systems, arrow stick controls, etc. The overhead console shall be approximately 27" wide x 4" high x 13" deep and shall be integrated into the ABS overhead center panel. The overhead console shall not obstruct the driver's vision through the officer's side window.

CLIMATE CONTROL SYSTEM

A climate-control system shall be provided for total cab environmental comfort. This system shall provide heat, cooling and defrost capabilities to various areas in the cab. The system shall consist of a single evaporator unit, mounted in the center overhead of the cab.

The ceiling mounted evaporator/heater unit shall include the following:

- Heavy-duty, high output blower.
- High efficiency coil that includes "rifled" tubing and oversized header tubes for maximum refrigerant distribution.
- Four (4) 3" diameter, adjustable louvers; two (2) each side of the cab overhead, facing the driver and officer seat positions.
- Two (2) larger louvers located in the center of the overhead assembly, facing the windshield.
- A large center mounted multi-vent defroster louver positioned above the windshield to provide adequate airflow for windshield defrost.
- Four (4) integral 3" diameter adjustable louvers, one (1) below the driver and officer seat positions and one (1) under each outboard rear facing crew seat.
- Damper controls shall be pneumatically operated to provide air discharge to the windshield, front overhead air discharge louvers or the seat riser/floor outlets as required.
- An adjustable electric water valve to control the amount of heat.
- Housing shall be fully insulated and enclosed.
- BTU: 72,000 A/C
- BTU: 104,000 Heat
- CFM: 850 Heat as mounted in the cab
- CFM: 850 A/C as mounted in the cab.

The ceiling mounted evaporator unit shall be designed to include a deep well condensate collection pan, which shall include an automatic air vacuum pump to ensure proper drainage.

The ceiling mounted evaporator unit shall be enclosed with an ergonomically designed, custom padded ABS panel to provide maximum headroom and a pleasing appearance.

A serviceable foam intake filter shall be installed on the rear of the evaporator.

The controls 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.

All defrost/heating systems shall be plumbed with one (1) seasonal shut-off valve mounted near the engine.

ROOF MOUNT CONDENSER

A 12-volt roof top condenser shall be strategically positioned on the cab roof so as not to interfere with any emergency lighting systems. The condenser shall be designed with high performance, long life fan assemblies. The fan motors are to be equipped with sealed housings and shaft.

The condenser and coil design shall include rifled tubing for maximum efficiency. Each coil shall be painted black. The condenser unit must include a receiver drier with a high and low pressure switch. The wire harness shall include necessary wiring for the clutch circuit as well as a separate power relay circuit.

Mounting design shall enable easy servicing of all components and unit replacement if necessary.

CLIMATE CONTROL SWITCHES

The driver's overhead panel shall contain all controls for the cab climate control system. The following controls shall be provided: mode selector switch, front fan speed switch, rear fan speed switch, air conditioning on/off switch, and temperature control dial. All controls shall be clearly labeled, adequately backlit, and installed in an easily removable panel.

CAB TILT ASSEMBLY

The cab tilt mechanism shall be custom designed for ease of maintenance and shall consist of two (2) hydraulic cylinders with a maximum lift capacity of 19,625 pounds. Hydraulic lines shall be rated at 20,000 PSI burst pressure. Each cylinder shall have an attached hydraulic locking mechanism, in the event of a hydraulic failure. Hydraulic cylinders shall be detachable to allow removal of the engine for major service. A mechanical cylinder stay bar and release shall be provided to insure a positive lock in the tilted position.

The two (2) rear outboard cab latches shall be of the hydraulic pressure release, automatic re-latching type, and provide an automatic positive lock when the cab is lowered. The latch must not disengage or experience any damage when subjected to a pull apart tensile load of 6,000 lbs. The hydraulic pressure required to unlock the latch shall not exceed 550 PSI. The latch shall withstand 5,000 PSI without leaks or damage and withstand 1,000 continuous cycles of operation under a load of 1,000 lbs at liftoff. The tilt pump shall be electric over hydraulic type, with a pressure rating of not less than 4,000 PSI. Additionally, the cab tilt device shall be both electrically and hydraulically interlocked to prevent inadvertent activation of the cab tilt system.

- A "CAB NOT LATCHED" indicator shall be provided in the cab dash-warning cluster.
- A dual switch control system shall be provided for the cab tilt, located on the passenger side pump panel. System shall consist of a three (3) position toggle switch along with a rubber covered push button switch.

The cab tilt control shall be equipped with an interlock that shall disable the cab tilt system, in the event the parking brake is not applied.

CHASSIS FRAME ASSEMBLY

The chassis frame shall be fabricated in its entirety in the factory of the apparatus manufacturer. This shall prevent any split responsibility in warranty or service.

The frame shall consist of two (2) channels fastened together by cross members. All structural fasteners used in the frame shall be Grade 8 hardware. Hardened steel washers shall be used under all bolt heads and nuts to avoid stress concentrations. Top flange shall be free of bolt heads. All spring hangers shall be machined steel castings. Weldment type chassis and the use of Huck bolts shall not be acceptable.

Each main frame rail shall be 10-1/4" x 4" x 3/8", fabricated from 110,000 PSI minimum yield steel, with a minimum section modulus of 17.97 in 4 and a resisting bending moment (RBM) of 1,976,700 inch pounds.

Formed frame rails or a fish plated frame shall not be acceptable.

The chassis frame assembly, consisting of frame rails, cross members, axles and steering gear(s), shall be finish painted before installation of any electrical wiring, fuel system components, or air system components. All components or brackets fastened to the frame rails shall be cleaned, primed and painted prior to being attached to the frame rails.

***** FRONT BUMPER, EXTENSION & ACCESSORIES *****

PAINTED STEEL FRONT BUMPER

A 12" high, 101" wide, painted steel front bumper shall be provided. The bumper shall be constructed from a minimum of .135 gauge steel, which shall be designed with 45-degree welded corners and a 2" flange on the top and bottom. The ends of the bumper shall be supported by horizontal channels, which shall extend from the frame rails to the sides of the bumper. The color of the bumper shall match the cab and body base color.

The bumper shall be extended 27" with a polished aluminum tread plate gravel shield enclosing the top and ends.

WINCH RECEIVER POINT- FRONT OF CHASSIS

A receiver point shall be provided below the front bumper for a portable winch. The receiver point shall be a 2 1/2" x 2 1/2" x 1/4" seamless steel tube welded and gusseted to 3" x 1 1/2" steel channel directly bolted to the chassis frame rails. A 12v electrical connection with a quick disconnect compatible with the port-able winch shall be provided adjacent to the receiver point. A plastic end cap shall be provided for the quick disconnect.

STORAGE WELL - DRIVER SIDE

One (1) storage well constructed of 1/8" aluminum shall be installed in the gravel shield. The intended use of this storage well is the storage of one electric hose reel with 100 feet of twin line hydraulic

hose. This storage well shall be located on the driver side of the bumper extension. The bottom of the storage well shall have a minimum of four (4) drain holes.

STORAGE WELL - OFFICER SIDE

One (1) storage well constructed of 1/8" aluminum shall be installed in the gravel shield. This storage well shall be located on the officer side of the bumper extension. The bottom of the storage well shall have a minimum of four (4) drain holes.

The front bumper shall have a hinged drop down section in front of the storage well to enable the hose line to be extended straight forward. The hose well shall have the front wall cut out for hose extension. The 1 ½" discharge will extend straight through the rear wall of the hose well, and will be positioned to allow hose to be easily attached. The hose well is intended to store at least two 50' rolls of 1 ¾" hose and TFT fog nozzle.

REEL STORAGE COVER, FULL WIDTH

A raised tread plate cover shall be provided over the full width of the front bumper. The cover shall be hinged at the bottom rear and shall be held in the open position with two (2) gas shock stay arms. The cover shall be secured in the closed position with two (2) rubber hold down clamps. Two (2) chrome "D" grab handles shall be located on the front face for assisting in opening/closing of the cover.

One (1) Amdor Luma Bar LED strip light shall be mounted to the underside of the lid and wired to a magnetic door switch for auto ON/OFF when the cover is opened.

TOW HOOKS

Two (2) front painted tow hooks shall be fastened directly to the frame, below the front bumper. The tow hooks shall be fastened with grade 8 bolts and nuts.

FRONT AXLE

Front axle shall be a Meritor MFS-20-133 A-N, includes low friction "Easy Steer" bushing technology for maximum steering ease and longer life.

The front axle shall be rated at 21,480 lbs. (Minimum)

FRONT DISC BRAKES

Meritor EX-225 H, 17" disc brakes shall be provided for the front axle. The front brakes will be full air actuated with automatic slack adjustment.

Premium oil seals with viewer glass shall be provided on the front axle.

FRONT SUSPENSION

Front suspension shall be progressive rate front leaf springs. The spring shall be permanently pinned at the front and have a shackle double pinned mounting at the rear. Suspensions allowing the spring to float freely at the ends without a permanent pin shall not be acceptable.

The front leaf springs shall have a minimum of 10 leaves, a minimum length of 51", and a minimum width of 3-1/2". The capacity at ground shall be 21,500 lbs. All springs shall be of center bolt design. Cup center springs shall not be acceptable. All spring pins shall be positively restrained from rotating in brackets and shackles.

FRONT SHOCK ABSORBERS

The front suspension system shall be equipped with Koni, model # 90-194-3 SP 4, adjustable double acting hydraulic shock absorbers. Shock absorbers to have a minimum bore of 1.38" and an outside diameter of approximately 3-1/4".

REAR AXLE

Rear axle shall be a single, Meritor RS-30-185 with a capacity of 31,500 lbs. (Minimum). Axle shall be a single reduction axle with hypoid gearing and oil-lubricated wheels bearing. Oil seals shall be provided as standard equipment.

REAR BRAKES

Brakes shall be "S" Cam, 16-1/2" x 8 5/8" size and shall be full air actuated with automatic slack adjusters.

REAR AXLE TOP SPEED

The rear axle/s shall be geared for a vehicle top speed in accordance with NFPA sections 4.15.2 and 4.15.3.

Units with GVWR over 26,000 pounds shall be limited to 68 mph. If the combined tank capacity is over 1250 gallons of foam and water or the GVWR is over 50,000 pounds, the vehicle top speed shall be limited to 60 mph or the fire service rating of the tires, whichever is lower.

TIRE CHAINS

The vehicles rear drive axle shall be equipped with an On-Spot tire chain system. The system shall utilize the air compressor system as provided with the chain system. A switch shall be provided in the drivers console area to control the activation of the chains. The switch shall have a safety feature, which does not allow for inadvertent activation.

REAR SUSPENSION

The rear suspension shall be leaf-type variable rate with a 33,000 lb rating. The main spring assembly shall consist of 16 leaves with the main spring measuring 60.5" L x 3" W.

There shall be a rubber block helper mounted above the leaf springs, rated at 4,500 lbs. Two (2) fully wrapped leaves shall transmit driving and braking torque. Suspension rating shall be designed to match or exceed the rear axle rating. Designs allowing the main pack to float are not acceptable.

REAR SHOCK ABSORBERS

The rear suspension system shall be equipped with Monroe, model "Magnum" model #74001, double acting hydraulic shock absorbers. Shock absorbers to have a minimum bore of 1.38" and an outside diameter of approximately 3-1/4".

******* AIR & BRAKE SYSTEM *******

BRAKE SYSTEM

A dual circuit, air operated braking system, meeting the design and performance requirements of FMVSS -121 and the operating test requirements of NFPA 1901 current edition shall be installed. It shall be direct air type with dual air treadle in the cab. The system shall be powered by an engine mounted, gear driven air compressor protected by a heated air dryer.

The air system shall be plumbed with reinforced, air brake tubing/hose in conformance to SAE J 844-94, Type B and U.S.D.O.T. standards. The compressor discharge shall be plumbed with stainless steel braided hose lines with a Teflon lining. Eaton Synflex Eclipse Air Brake tubing shall be run along the inside frame rails and connected with Eaton Q-CAB 217 series fittings that meet or exceed all industry standards. All Synflex tubing shall be secured with non-conductive, corrosion resistant strapping mounted with standoff fasteners. Cord reinforced rubber hose lines with brass fittings shall be installed from the frame rails to axle mounted air connections.

The air system shall provide a rapid air build-up feature and low-pressure protection valve with light and buzzer, designed to meet the requirements of NFPA 1901, current

ABS SYSTEM

An Anti-Skid Braking System (ABS) shall be provided to improve braking control and reduce stopping distance. This braking system shall be fitted to all of the axles. All electrical connections shall be environmentally sealed, water, weatherproof, and vibration resistant.

The system shall constantly monitor wheel behavior during braking. Sensors on each wheel shall transmit wheel speed data to an electronic processor which shall sense approaching wheel lock causing instant brake pressure modulation up to 5 times per second in order to prevent wheel lockup. Each wheel shall be individually controlled.

To improve service trouble shooting, provisions in the system for an optional diagnostic tester shall be provided. The system shall test itself each time the vehicle is started. A dash-mounted light shall

go out once the vehicle has attained 4 mph after successful ABS start-up To improve field performance; the system shall be equipped with a dual circuit design. The system circuits shall be configured in a diagonal pattern. Should a malfunction occur, the defective circuit shall revert to normal braking action. A warning light shall signal malfunction to the operator. The system shall consist of a wheel mounted toothed ring, sensor, sensor clip, electronic control unit and solenoid control valve.

The sensor clip shall hold the sensor in close proximity to the toothed ring. An inductive sensor consisting of a permanent magnet with a round pole pin and coil shall produce an alternating current with a frequency proportional to wheel speed. The unit shall be sealed, corrosion resistant and protected from electromagnetic interference. The electronic control unit shall monitor the speed of each wheel. A deviation shall be corrected by cyclical brake application and release. If a malfunction occurs, the defective circuit shall signal the operator and the malfunctioning portion of the system shall shut down. The system shall be installed in a diagonal pattern for side-to-side control. The system shall insure that each wheel is braking to optimum efficiency up to 5 times a second.

The system shall also control application of the auxiliary engine exhaust or drive line brakes to prevent wheel lock.

This system shall have a three (3) year or 300,000 mile parts and labor warranty as provided by Meritor Wabco Vehicle Control Systems.

AUTOMATIC TRACTION CONTROL (ATC)

To further improve vehicle drive characteristics, the unit shall be fitted with automatic traction control (ATC). This system shall control drive wheel slip during acceleration from a resting point. An extra solenoid valve shall be added to the ABS system. The system shall control the engine and brakes to ensure efficient acceleration. The system shall be equipped with a dash-mounted light that shall come on when ATC is controlling drive wheel slip. The system shall also include an "off road traction" dash mounted switch that will allow the operator to momentarily allow for more wheel slip when the unit is in deep mud or snow.

This system shall have a three (3) year or 300,000 mile parts and labor warranty as provided by Meritor Wabco Vehicle Control Systems.

BRAKE AIR RESERVOIRS

There shall be a minimum of three (3) air reservoirs installed in conformance with best automotive practices.

An additional 1200 cu. in. air reservoir shall be provided for the accessory air outlet.

Reservoir capacity total shall be a minimum of 5600 cubic inches.

The air reservoirs shall be color coded to match the air lines for easy identification, ease of maintenance and troubleshooting. The reservoirs shall be painted the following colors:

- Wet Tank Black
- Primary Tank Green

- Secondary Tank Blue
- Auxiliary Tank(s) Yellow.

There shall be heated automatic moisture ejectors on all primary or wet tanks.
For ease of daily maintenance, each air system reservoir shall be equipped with a brass 1/4 turn drain valve.

AIR DRYER

A Bendix #AD-9 heated air dryer shall be furnished. An automatic moisture ejector on the primary, or wet tank, shall also be furnished

AIR LINES

The entire chassis air system shall be plumbed utilizing reinforced, Synflex air lines. All of the airlines shall be color coded to correspond with an air system schematic and shall be adequately protected from heat and chafing.

AIR COMPRESSOR

Air compressor shall be a Bendix model, with a minimum of 15.9 cu. ft. per minute capacity. Air brake system shall be the quick build up type. The air compressor discharge line shall be stainless steel braid reinforced Teflon hose.

A pressure protection valve shall be installed to prevent the use of air horns or other air operated devices should the air system pressure drop below 80 psi (552 kPa). Air compressor shall cut out at 130 psi and cut in no lower than 105 psi.

The chassis air system shall meet NFPA 1901, latest edition for rapid air pressure build-up within sixty (60) seconds from a completely discharged air system. This system shall provide sufficient air pressure so that the apparatus has no brake drag and is able to stop under the intended operating conditions following the sixty (60) seconds build-up time.

BRAKE TREADLE VALVE

A Bendix dual brake treadle valve shall be mounted on the floor in front of the driver. The brake control shall be positioned to provide unobstructed access and comfort for the driver.

PARKING BRAKE

Parking brake shall be of the spring-actuated type, mounted on the rear axle brake chambers. The parking brake control shall be mounted on the cab center instrument panel, offset toward the driver. A red indicator light shall be provided in the driver dash panel that shall illuminate when the parking brake is applied.

FRONT WHEELS & TIRES

The front wheels shall be 22.5" x 12.25" ten stud, hub piloted polished aluminum disc type.

The aluminum disc front wheels shall be provided with bright nut covers and hub caps.

The front tires shall be Goodyear 425/65R22.5 "20 Ply" tubeless radial G286A-SS on/off road tread. The tires shall be fire service rated up to 24,400 lbs and shall have a top speed of 68 mph when inflated to 120 psi.

Fire Service Rating defined as no more than 50 miles of continuous operation at maximum load, or without stopping for at least 20 minutes. Emergency vehicle must reduce its speed to no more than 50 mph after the first 50 miles of travel.

Industry load and inflation standards are in a constant state of change. Printed material may not reflect the latest load and inflation standards.

NOTE: NEVER EXCEED THE MAXIMUM AIR PRESSURE LIMITATION

REAR WHEELS & TIRES

The rear wheels shall be 22.5" x 9" ten stud, hub piloted polished aluminum disc type.

The single rear axle aluminum disc wheels shall be provided with bright nut covers and hub covers.

The rear tires shall be Goodyear 315/80R22.5 "20 Ply" tubeless radial G291 highway tread. The tires shall be fire service rated up to 35,400 lbs and shall have a top speed of 68 mph when inflated to 130 psi.

Fire Service Rating defined as no more than 50 miles of continuous operation at maximum load, or without stopping for at least 20 minutes. Emergency vehicle must reduce its speed to no more than 50 mph after the first 50 miles of travel.

Industry load and inflation standards are in a constant state of change. Printed material may not reflect the latest load and inflation standards.

NOTE: NEVER EXCEED THE MAXIMUM AIR PRESSURE LIMITATION.

TIRE PRESSURE MONITORING DEVICES

Each tire shall be equipped with an air pressure indicator cap on the valve stem. Each cap shall have a visual indicator to show if the tire is correctly inflated.

******* ENGINE, TRANSMISSION & ACCESSORIES *******

ENGINE

The engine shall be a Maxxforce 13, 12.4 Liter, diesel, dual turbo-charged, electronically controlled, per the following specifications.

- Max. Horsepower 475 HP @ 1700 RPM
- Governed Speed 2100 RPM
- Peak Torque 1700 lb. ft. @ 1000 RPM
- Cylinders Six (6)
- Operating Cycles Four (4)
- Bore & Stroke 4.96 x 6.54 in.
- Displacement 758 cu. in.
- Compression Ratio 17:1
- Drive line Size 1810
- Fan Drive Thermal Clutch.

Engine oil filters shall be engine manufacturers branded or approved equal. Engine oil filters shall be accessible for ease of service and replacement.

A fuel/water separator shall be provided.

Engine shall be installed in accordance with engine manufacturer's instructions, and the chassis manufacturer shall be able to furnish proof of engine installation approval by the engine manufacturer.

COOLING/RADIATOR

The cooling system shall be designed for a maximum of fifteen (15) PSI operation. There shall be a sight glass in the radiator overflow tank to check the coolant level without removing the radiator cap.

Extended life engine coolant shall provide anti-freeze protection to -30° F. The mixture shall be per the engine manufacture's specifications.

A transmission oil to liquid cooler shall be furnished.

RADIATOR SKID PLATE

The radiator installation shall include a heavy-duty radiator skid plate to protect the radiator from debris or obstructions under the chassis. The skid plate shall be designed so the angle of approach is not affected.

CHARGE AIR COOLER

The charge air cooler shall be constructed of aluminum with cast aluminum side tanks.

The charge air cooler shall be mounted directly on top of the radiator. Rubber isolators shall be used at the mounting points to reduce transmission of vibrations.

The piping between the charge air cooler and engine shall use heavy duty hoses with stainless

steel bands. Bands are used to maintain the shape of the hose during changing turbo boost pressures. The hoses shall be attached with stainless steel constant torque hose clamps.

COOLING SYSTEM FAN

The engine cooling system shall incorporate a heavy duty fan, installed on the engine and include a shroud.

The fan shall be equipped with an air operated clutch fan, which shall activate at a pre-determined temperature range.

Re-circulation shields shall be installed to ensure that air which has passed through the radiator is not drawn through it again.

Heavy duty silicone heater and coolant hoses shall be furnished for the heater and coolant system. All coolant hoses shall be equipped with constant torque type hose clamps. All integral hoses supplied with the engine shall be as supplied by the engine manufacturer.

LOW COOLANT INDICATOR LIGHT AND ALARM

A low engine coolant indicator light located in the dash instrument panel shall be provided. An audible alarm shall be provided to warn of the low coolant condition.

ENGINE BRAKE

An engine compression brake shall be furnished for increased braking capabilities. Controls shall be as provided by the engine manufacturer and shall be activated by releasing the throttle pedal to the idle position.

The engine compression brake shall have dash mounted control switches to turn the brake on or off as well as to control the operational level of the brake.

The engine brake shall be wired in such a manner so as to illuminate the chassis brake lights when the engine brake is engaged and operating.

The engine brake shall be interlocked with the PTO operation and shall automatically disengage any time the apparatus is operating with the PTO active.

ENGINE FAST IDLE

A fast idle for the electronic controlled engine shall be provided. The fast idle shall be controlled by an ON/OFF switch on the dash.

An electronic interlock system shall prevent the fast idle from operating unless the transmission is in "Neutral" (or "Park" if so equipped) and the parking brake is fully engaged. If the fast idle control is used in conjunction with a specified engine/transmission driven component or accessory, the fast idle

control shall be properly interlocked with the engagement of the specified component or accessory.

AIR CLEANER

An engine air cleaner shall be provided. Air cleaner shall include a dry type element. Air cleaner shall be installed in accordance with the engine manufacturer's recommendations. The air cleaner shall be located to the rear of the engine, with streamline air pipes and hump hose connections from the inlet to the air cleaner and from the air cleaner to the turbo. The air cleaner shall be easily accessible when the cab is tilted.

Air cleaners mounted on the side or near the bottom of the cab shall not be acceptable. NO EXCEPTIONS

SPARK ARRESTOR

A spark arrestor shall be installed in the chassis air intake system. This arrestor shall be mounted behind the intake grille to filter out airborne embers. The spark arrestor housing must be easily accessible when the cab is tilted.

ACCELERATOR CONTROL

A floor mount accelerator pedal shall be installed on the floor in front of the driver. The pedal shall be positioned for comfort with ample space for fire boots and adequate clearance from the brake pedal control.

TRANSMISSION

An Allison World Transmission, Model 4000 EVS electronically controlled, automatic transmission shall be provided. Transmission specifications shall be as follows:

- Max. Gross Input Power 600 HP
- Max. Gross Input Torque 1850 lb. ft.
- Input Speed (Range) 1700- 2300 RPM
- Shift Calibrations 5 Speed (6th not avail. for fire appl.)
- Direct Gear (Pumping) 4th (Lock-up)
- Direct Gear Ratio 1.00:1
- Overdrive Ratio 0.74:1.

Transmission installation shall be in accordance with the transmission manufacturer's specification. The transmission shall be readily and easily removable for repairs or replacement.

An illuminated, touch-pad type shift control shall be mounted in the cab, convenient to the driver. Shift control shall be approved by the transmission manufacturer.

TRANSMISSION OIL LEVEL SENSOR

The transmission shall be equipped with the oil level sensor (OLS); this sensor shall allow the operator to obtain an indication of the fluid level from the shift selector. The sensor display shall provide the following checks, correct fluid level, low fluid level and high fluid level.

PARK TO NEUTRAL

The transmission, upon application of the parking brake, shall automatically shift into neutral.

TRANSMISSION FLUID

TES-389 transmission fluid shall be utilized to fill the 4000 EVS transmission.

DRIVE LINES

Drive lines shall be Dana (Spicer) 1810 heavy duty series or equal, with "glide coat" splines on all slip shafts. The chassis manufacturer shall utilize an electronic type balancing machine to statically and dynamically balance all drive shafts. The chassis manufacturer shall be able to provide proof of compliance with all drive shaft manufacturer's standards and specifications. (No Exceptions)

EXHAUST SYSTEM

The exhaust system shall be installed in accordance with the engine manufacturer's requirements and meet all Environmental Protection Agency and State noise level requirements. Exhaust system components shall be securely mounted and easily removable.

The diesel particulate filter/muffler shall be fabricated from stainless steel and of a size compatible with the engine exhaust discharge.

Exhaust tubing shall be a minimum of 16 gauge stainless steel from the turbocharger on the engine to the inlet of the diesel particulate filter. Any flexible exhaust tubing shall be HDT stainless steel type. To minimize heat build-up, exhaust tubing within the engine compartment shall be wrapped with an insulating material. Exhaust shall be wrapped from the turbocharger to the entrance of the muffler. Material shall be held in place with worm gear type clamps.

An exhaust diffuser shall be provided to reduce the temperature of the exhaust as it exits the tailpipe.

The computer controlling the engine shall be programmed in such a manner that it shall not allow the engine to go into regen mode while the fire pump is engaged. Separate "regeneration" enable and prohibit switches shall be provided under the dash board on the driver's side. Each switch shall be provided with a spring loaded protective cover and shall be clearly marked as to function.

The exhaust tailpipe extending from the muffler (DPF) to the side of the vehicle shall be constructed from 16-gauge aluminized steel tubing. The exhaust discharge shall be on the officer side of the apparatus forward of the rear axle.

****** FUEL SYSTEM ******

FUEL TANK

Fuel tank shall be a minimum of fifty (50) gallon capacity. It shall have a minimum fuel filler neck of 2" ID. A 1/2" minimum diameter drain plug shall be provided. The tank shall be fabricated from hot rolled, pickled and oiled steel. Provisions for an additional feed line and fuel level float shall be provided for apparatus manufacturer's use.

The fuel tank shall be installed behind the rear wheels between the frame rails.

The fuel tank shall meet all FHWA 393.67 requirements including a fill capacity of 95% of tank volume.

The fuel lines shall be ParaFlex HTFL fuel hose. The lines shall be carefully routed and secured along the inside of the frame rails.

FUEL COOLING SYSTEM

A fuel cooling system shall be provided. The heat exchanger shall be a tube and fin type and shall be a separate unit. The cooler shall be mounted forward of the radiator and plumbed to the fuel return line.

FUEL FILTER/WATER SEPARATOR

A Racor heated fuel filter/water separator shall be provided in the fuel system. A "water in fuel" indicator shall be provided on the dash.

SECONDARY ELECTRIC FUEL PUMP

In addition to the primary fuel pump, a secondary electric fuel pump for re-priming shall be furnished in the main fuel line. A labeled control switch shall be provided on the main dash panel.

FUEL POCKET

A fuel fill shall be provided in the left side rear wheel well area. A Cast Products heavy duty cast aluminum spring loaded hinged fill door shall be provided.

A label indicating "Ultra Low Sulfur Diesel Fuel Only" shall be provided adjacent to the fuel fill.

DUAL POWER STEERING

A dual power steering system shall be provided utilizing a Sheppard model #M110 main steering gear on the driver side of the chassis and a Sheppard model #M90 assist steering gear on the officer side of the chassis.

The power steering gear on the officer side of the chassis will increase performance in turning the officer side wheel assembly, reducing loads and forces on the main gear and components.

The steering system shall be designed to maximize the turning capabilities of the front axle no matter the rating and tire size. The use of a power assist cylinder on the officer side of the chassis is NOT ACCEPTABLE.

The system shall be designed utilizing an engine driven hydraulic pump, with a maximum operating pressure of 2000 PSI. Steering design shall permit a maximum of 5.6 turns from stop to stop. Steering system components shall be mounted in accordance with the steering gear manufacturer's instructions.

STEERING WHEEL & COLUMN

The steering wheel shall be vinyl padded, minimum 18" diameter, with a center hub mounted horn button. There shall be a self-canceling, directional signal lever and a traffic hazard switch on the steering column. The high beam activator shall be controlled by pulling the directional signal lever toward the driver.

The steering column shall have a separate lever control for tilting and telescoping capability.

ROAD SAFETY KIT

A road safety kit shall be furnished with the following equipment:

- 2 1/2 lb. B-C fire extinguisher
- Triangle safety reflectors

******* CHASSIS/BODY ELECTRICAL & ACCESSORIES *******

CHASSIS ELECTRICAL SYSTEM

All electrical wiring in the chassis shall be SXL cross link insulated type. Wiring is to be color coded and include function codes every three (3) inches on both sides. Wiring harnesses shall be routed in protective, heat resistant loom, securely and neatly installed. Two (2) power distribution centers shall be provided in central locations for greater accessibility. The power distribution centers shall contain automatic thermal self resetting breakers, power control relays, flashers, diode modules, daytime driving light module, and engine and transmission data links. All breakers and relays shall have a capacity substantially greater than the expected load on the related circuit, thus ensuring long component life. Power distribution centers shall be composed of a system of interlocking plastic modules for ease of custom construction.

The power distribution centers shall be function oriented. The first is to control major truck function. The second control center shall enable overhead switching and interior operations. Each module shall be single function coded and labeled to aid in troubleshooting. The centers shall also have accessory breakers and relays for future installations. All harnesses and power distribution centers shall be electrically tested prior to installation to ensure the highest system reliability.

All external harness interfaces shall be of a triple seal type connection to ensure a proper connection. The cab/chassis and the chassis/body connection points shall be mounted in accessible locations. Complete chassis wiring schematics shall be supplied with the apparatus.

WIRING HARNESS DESCRIPTION

The wiring harness contained on the chassis shall be designed to utilize wires of stranded copper or copper alloy of a gauge rated to carry 125% of maximum current for which the circuit is protected without exceeding 10% voltage drop across the circuit. Wiring must be uniquely identified by color code or circuit function code, labeled at a minimum of every three (3) inches. The identification of the wiring shall be referenced on a wiring diagram. All wires conform to SAEJ1127 (Battery Cable), SAEJ1128 (Low Tension Primary Cable), SAEJ1560 (Low Tension Thin Wall Primary Cable).

The covering of harnesses shall be moisture resistant loom with a minimum rating of 289 Degrees Fahrenheit and a flammability rating of VW-1 as defined in UL62. The covering of jacketed cable shall have a minimum rating of 289 degree Fahrenheit.

All harnesses must be securely installed in areas protected against heat, liquid contaminants and damage. The harness connections and terminations shall use a method that provides a positive mechanical and electrical connection and are in accordance with the device manufacturer's instructions. No connections within the harness may utilize wire nut, insulation displacement, or insulation piercing components.

All circuits shall conform to SAEJ1292. All circuits must be provided with low voltage over current protective devices. These devices shall be readily accessible and protected against heat in excess of component rating, mechanical damage, and water spray. Star washers shall not used for ground connections.

DIRECT GROUNDING STRAPS

Direct grounding straps shall be mounted to the following areas; frame to cab, frame to body and frame to pump enclosure.

All exposed electrical connections shall be coated with "Z-Guard 8000" to prevent corrosion.

EMI/RFI PROTECTION

The apparatus shall incorporate the latest designs in the electrical system with state of the art components to insure that radiated and conducted electromagnetic interference (EMI) and radio frequency interference (RFI) emissions are suppressed at the source

The apparatus proposed shall have the ability to operate in the environment typically found in fire

ground operations with no adverse effects from EMI/RFI.

EMI/RFI susceptibility is controlled by utilizing components that are fully protected and wiring that utilizes shielding and loop back grounds where required. The apparatus shall be bonded through wire braided ground straps. Relays and solenoids that are suspect to generating spurious electromagnetic radiation are diode protected to prevent transient voltage spikes

In order to fully prevent the radio frequency interference the purchaser may be requested to provide a listing of the type, power output, and frequencies of all radio and bio medical equipment that is proposed to be used on the apparatus.

12 VOLT ELECTRICAL SYSTEM TESTING

The apparatus low voltage electrical system shall be tested and certified by the apparatus manufacture. The certification shall be provided with the apparatus. All tests shall be performed with air temperature between 0°F and 100°F.

The following three (3) tests shall be performed in order. Before each test, the batteries shall be fully charged.

TEST #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 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 test failure.

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.

TEST #3-ALTERNATOR PERFORMANCE TEST AT FULL LOAD

The total continuous electrical load shall be activated with the engine running up to the engine manufacturers governed speed. The test duration shall be a minimum of 2 hours. Activation of the load management system shall be permitted during this test. However, an alarm sounded due to excessive battery discharge, as detected by the system, or a system voltage of less than 11.7 volts DC for a 12 volt system, for more than 120 seconds, shall be considered a test failure.

LOW VOLTAGE ALARM TEST

Following completion of the preceding 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 is activated.

The battery voltage shall be measured at the battery terminals. With the load still applied, a reading of less than 11.7 volts shall be considered a test failure. The battery system shall then be able to restart the engine.

At time of delivery, documentation shall be provided with the following information:

- Documentation of the electrical system performance test
- A written load analysis of the following;
  - Nameplate rating of the alternator
  - Alternator rating at idle while meeting the minimum continuous electrical load
  - Each component load comprising the minimum continuous electrical load.
  - Additional loads that, when added to the minimum continuous load, determine the total connected load.
  - Each individual intermittent load.

LOAD MANAGEMENT SYSTEM

A load management system shall be provided for performing electrical load management. The load manager shall have 16 programmable outputs to supply warning and load switching requirements. The load management system shall be capable of offering load sequencing, load shedding, fast idle control, low voltage warning, scene mode operation and response mode operation.

Outputs 1 thru 12 shall be independently programmable to activate during the scene mode, the response mode or both. These outputs can also be programmed to activate with the ignition or master warning switch, or to sequence and shed along with the priority. Output 13 shall be designated to activate a fast idle system. Output 14 shall provide a low voltage warning for an isolated battery. Output 15 is a user configurable output and shall be programmable for activating between 10.5 and 15 volts. Output 16 shall provide a low voltage alarm that activates at the NFPA required 11.8 volts.

The load management shall have a digital display to indicate system voltage in normal operation mode and also indicate the output configuration during programming mode.

The load management shall also be protected against reverse polarity and shorted outputs, and be enclosed in a metal enclosure to enhance EMI/RFI protection.

DIAGNOSTICS

Diagnostic ports shall be accessible while standing on the ground and located inside the driver's side door left of the steering column. The diagnostic panel shall allow diagnostic tools such as computers to connect to various vehicle systems for improved troubleshooting providing a lower cost of ownership. Diagnostic switches shall allow engine and ABS systems to provide blink codes should a problem exist.

The diagnostic system shall include the following:

- Engine diagnostic port
- Transmission and ABS diagnostic port
- Roll sensor diagnostic port (if applicable).

Additional diagnostic locations under the officers side of the dash.

- Engine diagnostic switch (blink codes)
- ABS diagnostic switch (blink codes).

VOLTAGE MONITOR SYSTEM

A voltage monitoring system shall be provided to indicate the status of the battery system connected to the vehicle's electrical load. The system shall provide visual and audible warning when the system voltage is below or above optimum levels.

The alarm shall activate if the system falls below 11.8 volts DC for more than two (2) minutes.

INDICATOR LIGHT AND ALARM PROVE-OUT SYSTEM

A system shall be provided which automatically tests basic indicator lights and alarms located on the cab instrument panel.

SEQUENCER

A sequencer shall be provided that automatically activates and deactivates vehicle loads in a preset sequence thereby protecting the alternator from power surges. This sequencer operation shall allow a gradual increase or decrease in alternator output, rather than loading or dumping the entire 12 volt load to prolong the life of the alternator.

Emergency light sequencing shall operate in conjunction with the emergency master light switch. When the emergency master switch is activated, the emergency lights shall be activated one by one at half second intervals. Sequenced emergency light switch indicators shall flash while waiting for activation.

When the emergency master switch is deactivated, the sequencer shall deactivate the warning light loads in the reverse order.

Rear of cab Air-Conditioning and Heat shall be load managed.

ELECTRICAL HARNESS REQUIREMENT

To ensure dependability, all 12-volt wiring harnesses installed by the apparatus manufacturer shall conform to the following specifications:

- SAE J 1128 - Low tension primary cable

- SAE J 1292 - Automobile, truck, truck-tractor, trailer and motor coach wiring
- SAE J 163 - Low tension wiring and cable terminals and splice clips
- SAE J 2202 - 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 J 1939 - Serial communications protocol
- SAE J 2030 - Heavy-duty electrical connector performance standard
- SAE J 2223 - Connections for on board vehicle electrical wiring harnesses
- NEC - National Electrical Code
- SAE J 561 - Electrical terminals - Eyelet and spade type
- SAE J 928 - Electrical terminals - Pin and receptacle type A

For increased reliability and harness integrity, harnesses shall 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 shall not be allowed.

Wiring shall be run in loom or conduit where exposed, and have grommets or other edge protection where wires pass through metal. Wire colors shall 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 shall not be allowed. Function and number codes shall be continuously imprinted on all wiring harness conductors at 3.00" intervals. All wiring installed between the cab and into doors shall be protected by a wire conduit to protect the wiring. Exterior exposed wire connectors shall be positive locking, and environmentally sealed to withstand elements such as temperature extremes, moisture and automotive fluids. Electrical wiring and equipment shall be installed utilizing the following guidelines:

- All holes made in the roof shall be caulked with silicon (no exception). Large fender washers, liberally caulked, 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 shall not allow moisture to accumulate in it. Exposed area shall be defined as any location outside of the cab or body.
- For low cost of ownership, electrical components designed to be removed for maintenance shall be quickly accessible. For ease of use, a coil of wire shall be provided behind the appliance to allow them to be pulled away from the mounting area for inspection and service work.
- Corrosion preventative compound shall be applied to non-waterproof electrical connectors located outside of the cab or body. All non-waterproof connections shall re-quire 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 shall have corrosion preventative compound added to the socket terminal area.
- All electrical terminals in exposed areas shall have protective coating applied completely over the metal portion of the terminal.
- Rubber coated metal clamps shall be used to support wire harnessing and battery cables routed along the chassis frame rails.
- Heat shields shall be used to protect harnessing in areas where high temperatures exist. Harnessing passing near the engine exhaust shall be protected by a heat shield.
- Cab and crew cab harnessing shall not be routed through enclosed metal tubing. Dedicated wire

routing channels shall be used to protect harnessing therefore improving the overall integrity of the vehicle electrical system. The design of the cab shall allow for easy routing of additional wiring and easy access to existing wiring.

- All standard wiring entering or exiting the cab shall be routed through sealed bulkhead connectors to protect against water intrusion into the cab.

BATTERY CABLE INSTALLATION

All 12-volt battery cables and battery cable harnessing installed by the apparatus manufacturer shall conform to the following requirements:

- SAE J 1127 - Battery Cable
- SAE J 561 - Electrical terminals, eyelets and spade type
- SAE J 562 - Nonmetallic loom
- SAE J 836 A - Automotive metallurgical joining
- SAE J 1292 - Automotive truck, truck-tractor, trailer and motor coach wiring
- NFPA 1901 - Standard for automotive fire apparatus

Battery cables and battery cable harnessing shall be installed utilizing the following guidelines:

- Splices shall not be allowed on battery cables or battery cable harnesses.
- For ease of identification and simplified use, battery cables shall be color coded. All positive battery cables shall be marked red in color. All negative battery cables shall be black in color.
- For ease of identification, all positive battery cable isolated studs throughout the cab and chassis shall be red in color.
- For increased reliability and reduced maintenance, all electrical buss bars located on the exterior of the apparatus shall be coated to prevent corrosion.

An operational test shall be conducted to ensure that any equipment that is permanently attached to the electrical system is properly connected and in working order.

ALTERNATOR

The alternator shall be Leece Neville Model 4890JB, 320 amp, serpentine belt driven unit. The installation shall include an integral self-diagnostic regulator and rectifier for compact installation.

The alternator installation shall be designed to provide maximum output at engine idle speed to meet the minimum continuous electrical load of the apparatus as required.

BATTERY SYSTEM

Five (5) Exide #HP-31D, Group 31, maintenance free batteries shall be provided. Each battery shall be rated at 925 CCA at 0° F and shall have a reserve capacity of 180 minutes.

Wiring for the batteries shall be 4/0 welding type dual path starting cables for SAEJ541.

BATTERY STORAGE

Batteries shall be securely mounted in fixed 3/16” GR50 steel trays located on each side of the chassis frame. Complete access shall be provided when the cab is fully tilted. Batteries shall be mounted on non-corrosive matting material.

BATTERY DISCONNECT SWITCH

The chassis batteries shall be wired in parallel to a single 12 volt electrical system, controlled through a heavy duty, rotary type, master disconnect switch. The master disconnect switch shall be located within easy access of the driver upon entering or exiting the cab.

BATTERY JUMPER STUDS

A set of Cole Hersee battery jumper studs, model #46210-02 (red) and #46210-03 (black) shall be provided to allow the battery system to be jump started or charged from an external source. The studs shall be located on the back wall of the drivers step well. Each stud shall be equipped with both a rubber protector cap and a 2” square non-conductive plate to prevent accidental shorting.

120 VOLT SHORELINE CONNECTION - "SUPER" AUTO EJECT

One (1) Kussmaul "Super" Auto Eject model 091-55-20-120, automatic, 120 volt, 20 amp shoreline disconnect shall be provided for the on board, 110 volt battery charging systems.

The disconnect shall be equipped with a NEMA 5-20 P male receptacle, which shall automatically eject the shoreline when the vehicle starter is energized. A label shall be provided indicating voltage and amperage ratings.

SHORELINE POWER INLET PLATE

A shoreline power receptacle information plate shall be permanently affixed at or near the power inlet. The plate shall indicate the following;

- Type of Line Voltage
- Current Rating in Amps Power Inlet Type (DC or AC)

The Kussmaul auto-eject connection shall be equipped with a Red weatherproof cover.

The shoreline receptacle shall be located in the area directly adjacent to the driver's side cab door.

BATTERY CHARGER / AIR COMPRESSOR SYSTEM

A Kussmaul model #091-9-1200, "Pump Plus 1200" air compressor/high output battery charger shall be provided for maintaining the vehicle's air / battery system. Unique electronic sensing circuits sense the true battery voltage while eliminating the need for external sense wires. Output current shall be 40 amperes @ 12 volt DC.

The air compressor shall maintain the air pressure in the chassis air brake system while the vehicle is not in use. The air compressor shall have a rated input at 12 volt DC @ 12 amps and an output of 0.30 SCFM @ 80 psi.

An LED bar graph display shall be located near the shoreline connection to monitor the battery status.

SHORELINE POWER STRIP

A 120 volt household type power strip shall be located inside the EMS compartment. The power strip shall be equipped with a minimum of six (6) outlets. The power strip shall be wired into the shoreline receptacle to provide a 120 volt power source for fire department equipment.

OUTLET STRIP

One (1) 3' long outlet strip shall be installed on the rear of the doghouse. Each outlet strip shall have four (4) duplex household receptacles.

EMERGENCY SWITCHES

A switch control console shall be provided in the center dash panel between the driver's and officer's position. This console shall separate the emergency / auxiliary electrical functions from the regular chassis functions. A minimum of ten (10) rocker type switches with integral indicator lights shall be provided, in addition to the Load Manager indicator.

A master switch with integral red indicator light shall be provided, which shall allow pre-setting of emergency light switch and shall have a red integral indicator light. A primary emergency lighting switch shall be provided, next to the master switch. Then a total of seven (7) load manageable emergency switches shall be provided. The last remaining switch shall be a ground light switch. All switches, (other than the master switch), shall have switch function labeling and an amber integral indicator light.

"LED" CAB INTERIOR LIGHTING

Four (4) Akron 8080-8000-13 interior LED combination red/white dome lights shall be furnished in the cab, two (2) in the forward section and two (2) in the rear crew section. Each dome light shall have an integral selector switch. Each dome light shall also activate when the respective, adjacent cab door is opened.

A shielded light shall be provided in each side opening, cab door step well. These lights shall activate with the respective door jamb switch.

One (1) Akron model #8080-8000-13 combination red/white LED dome light(s) shall be furnished in the forward section of the cab. Each additional dome light(s) shall have an integral selector switch.

Two (2) Akron model #8080-8000-13 combination red/white LED dome light(s) shall be furnished in the rear crew section of the cab. Each additional dome light(s) shall have an integral selector switch.

CAB MAP LIGHT

A Federal, model # LF18SB, "Littlite", 18" goose neck map light shall be furnished and located on the right side of the cab dash.

CAB MAP LIGHT

A Sunnex model #HS762-00 12 volt - 20 watt halogen light designed for direct connection shall be furnished and located at the officer side overhead. The light shall have a rectangular base with an on/off rocker switch and feature a swivel joint with 360 degree axial rotation and 90 degree angular adjustment.

"DO NOT MOVE APPARATUS" WARNING LIGHT WITH AUDIBLE ALARM

A red flashing warning light with an integral audible alarm, shall be functionally located in the cab to signal when an unsafe condition is present such as an open cab door or body compartment door, an extended ladder rack, a deployed stabilizer, an extended light tower or any other device which is opened, extended or deployed which may cause damage to the apparatus if it is moved.

This light shall be activated through the parking brake switch to signal when the parking brake is released. This light shall be labeled "DO NOT MOVE TRUCK".

POWER PORT

Three (3) 12 volt power port style accessory outlet(s) shall be installed in the cab of the truck for the fire departments accessory devices.

- One (1) power port shall be located adjacent to the computer slide tray to power the computer vehicle charger.
- Two (2) power ports shall be located on the dash as directed by the fire department at the pre-construction conference.

12 VOLT ACCESSORY CIRCUIT - CREW CAB AREA

A dedicated 12 volt power and ground circuit shall be provided in the rear crew area at the EMS cabinet and one to the area behind the officer’s seat and terminated. The circuit shall be for future installation of radios or accessories.

SAFETY VISION COLOR LED SYSTEM

A Safety Vision #SV-LCD65B-KIT rear vision camera system with audio shall be provided to allow the driver to visually see and hear at the rear of the apparatus while in the cab. The system shall include a flat screen 5.6" color monitor, color camera with microphone and LED Illuminators that shall be mounted at the rear of the vehicle.

Camera: Color SV-625 B rear vision camera with microphone. imager, 18 LED illuminators, waterproof threaded pigtail.

Monitor: Color SV-LCD 56 B rear vision monitor. 5.6 flat screen, speaker, audio and video adjustment controls, mirror/normal image switch, automatic-on in reverse, free voltage 10VCD-26VDC. Included cabling is the improved waterproof threaded metallic connector with rubber o-ring seal. Monitor only. 65' video cable, includes waterproof threaded connector at camera end.

The monitor for the rear vision system shall be mounted ceiling of the cab in easy view of the driver.

HEADLIGHTS CLUSTER

Two (2) quad, 165mm HID Xenon Low Beams and Two (2) rectangular halogen headlights, mounted in bright finish bezels shall be furnished on the front of the cab. Each light module shall incorporate an individual HID Xenon low beam and a halogen high beam headlight. High beam actuation shall be controlled on the turn signal lever.

DAYTIME RUNNING LIGHTS

The chassis head lights shall have integrated circuitry to actuate the low beam headlights at a maximum of 80 percent of capacity whenever the chassis engine is running.

The daytime running lights shall be interlocked with the parking brake and shut when activated.

UPPER LIGHT MODULE

Two (2) Whelen 60R00FRR super LED flashing light heads shall be provided, one (1) in each side dual light module, below the headlights, in matching chrome plated bezels. The color shall be red unless otherwise specified.

An individual control switch shall be provided on the cab switch console, which shall be wired through the load management system to prevent excessive amperage draw.

The lights noted above shall be provided in addition to the NFPA required, minimum optical warning light package.

The NFPA required, Zone "A" lower warning lights shall be incorporated into each side dual light module noted above.

ARROW TURN SIGNALS

Two (2) Whelen 60A00TAR arrow shaped, amber LED turn signals shall be provided in chrome plated housings, mounted one (1) each side between the windshield and the dual light modules.

DOT MARKER LIGHTS AND REFLECTORS

Five (5) DOT approved Whelen (or equal) Light Emitting Diode (LED) cab marker lamps shall mounted on the top front edge of the cab roof.

Amber LED marker lights with integral reflectors shall be provided on the side of the cab above the front wheel well, one (1) each side.

Truck-Lite Model #18 red LED marker lights with integral reflectors shall be provided at the lower side rear, one (1) each side.

Truck-Lite #60115Y yellow LED side marker and turn lights shall be provided on the apparatus lower side, forward of rear axle, one (1) each side.

Truck-Lite Model #19 red LED clearance lights shall be provided on the apparatus rear upper, one (1) each side at the outermost practical location.

Truck-Lite Model #33740R LED 3-lamp identification bar will be provided on the apparatus rear center. The lights shall be red in color.

Truck-Lite #98034Y yellow reflectors shall be provided on the apparatus body lower side, as far forward and low as practical, one (1) each side if the apparatus is 30' long or longer.

Truck-Lite #98034R red reflectors shall be provided on the apparatus rear, one (1) each side at the outermost practical location.

LICENSE PLATE LIGHT - REAR

One (1) license plate light shall be provided above the mounting position of the license plate. The light shall be clear in color.

TAIL, STOP, TURN AND BACK-UP LIGHTS

Two (2) Code 3 LED, 65PKG 4" x 6", stack shall be mounted, one each side, at the rear of the body. Each stack shall include a red stop/tail light, amber turn signal, and a white reverse light

Two (2) Code 3 65STK3 mounting flanges, installed one (1) on each side, shall be provided to mount the lights described above in one common mounting flange.

CAB STEP LIGHTS

Chrome plated Whelen model #0AC0EDCR, shielded LED chassis step lights shall be provided and controlled with marker light actuation. Step lights shall be located to properly illuminate all chassis access steps and walkway areas.

BODY STEP LIGHTS

Chrome plated Whelen model #0AC0EDCR, shielded LED body step lights shall be provided and controlled with marker light actuation. Step lights shall be located to properly illuminate all chassis access steps and walkway areas.

DUNNAGE AREA LIGHTING

Two (2) chrome plated Weldon model #9186, shielded halogen lights shall be provided in the dunnage area to provide adequate illumination of this area.

SCENE LIGHTS - BEHIND FRONT CAB DOORS

Two (2) Code 3 9 x 7 Octagonal halogen scene lights shall be provided, one on each side of the cab, directly behind the front cab entrance door. The scene lights shall be controlled by a rocker switch in the master warning light switch console. All scene lights shall be wired through the load management system.

SCENE LIGHTS - REAR OF BODY

Two (2) Code 3 9 x 7 Octagonal halogen scene lights shall be provided, one on each side of the rear body panel. The scene lights shall be controlled by a rocker switch in the master warning light switch console. All scene lights shall be wired through the load management system.

SCENE LIGHTS - SIDE OF BODY, FRONT

Two (2) Code 3 9 x 7 Octagonal halogen scene lights shall be provided. The scene lights shall be mounted one each side, to the front, on the upper side body panel. The scene lights shall be controlled by a rocker switch in the master warning light switch console. All scene lights shall be wired through the load management system.

SCENE LIGHTS - SIDE OF BODY, REAR

Two (2) Code 3 9 x 7 Octagonal halogen scene lights shall be provided. The scene lights shall be mounted one each side, to the rear, on the upper side body panel. The scene lights shall be controlled by a rocker switch in the master warning light switch console. All scene lights shall be wired through the load management system.

REAR SCENE LIGHTS - ADDITIONAL ACTIVATION

In addition to the cab mounted switch for the rear scene lights, the rear scene lights shall illuminate when the transmission is placed in reverse gear and the apparatus is operating as an emergency vehicle (Primary Warning switch on).

GROUND LIGHTS - CAB

One (1) Amdor Luma Bar H2O LED 20" ground light shall be provided under each side cab door entrance step, four (4) total. The ground lights shall turn on automatically with each respective door jamb switch and also by a master ground light switch in the warning light switch console.

Each light shall illuminate an area at a minimum 30" outward from the edge of the vehicle.

GROUND LIGHTS - PUMP PANEL

One (1) Amdor Luma Bar H2O LED 20" ground light shall be provided under each side pump panel running board, two (2). The ground lights shall be activated by a master ground light switch in the cab and shall be wired through the load management system.

GROUND LIGHTS - FRONT BODY

One (1) Amdor Luma Bar H2O LED 20" ground light shall be provided under each front body corner, two (2) total. The ground lights shall be activated by a master ground light switch in the cab and shall be wired through the load management system.

GROUND LIGHTS - REAR

One (1) Amdor Luma Bar H2O LED 20" ground light shall be provided under each rear body corner, two (2) total. The ground lights shall be activated by a master ground light switch in the cab and shall be wired through the load management system.

GROUND LIGHT SWITCHING

The cab and body ground lights shall activate by engaging the parking brake.

ROOF MOUNT 150W LED BROW LIGHT - ABOVE WINDSHIELD

Fire Research Focus model FCA800-Q13 contour roof mount light shall be installed. The mounting brackets shall attach to the bottom of the lamp head and be machined to conform to the roof radius. Wiring shall extend from a weatherproof strain relief at the rear of the lamp head.

The lamp head shall have eight (8) high output LED’s and shall draw 13 amps and generate 13,300 lumens. The lamp head shall direct 50 percent of the light onto the action area while providing 50 percent to illuminate the working area. The lamp head shall incorporate external heat-dissipating fins and be no more than 5" deep by 3 5/16" high by 11 1/2” wide. Lamp head and brackets shall be powder coated white. The floodlight shall be UL listed as scene lights for fire service use.

The Focus brow mounted flood light shall be located above the windshield in the center of the cab.

LIGHTS ABOVE WINDSHIELD MASTER POWER SWITCH

A master power switch shall be provided in the cab warning light switch console to turn the lights above windshield on and off.

****** BODY ELECTRICAL SYSTEM ******

12 VOLT BODY ELECTRICAL SYSTEM

All electrical lines in the body shall be protected by automatic circuit breakers, conveniently located to permit ease of service. Flashers, heavy solenoids and other major electrical controls shall be located in a central area near the circuit breakers.

All lines shall be color and function coded every 3", easy to identify, oversized for the intended loads and installed in accordance with a detailed diagram. A complete wiring diagram shall be supplied with the apparatus.

Wiring shall be carefully protected from weather elements and snagging. Heavy duty loom shall be used for the entire length. Grommets shall be utilized where wiring passes through panels.

In order to minimize the risk of heat damage, wires run in the engine compartment area shall be carefully installed and suitably protected by the installation of heat resistant shielded loom.

All electrical equipment shall be installed to conform to the latest federal standards as outlined in NFPA 1901.

BODY ELECTRICAL JUNCTION COMPARTMENT

A weather resistant electric junction compartment shall be provided in the left side lower front compartment. This compartment shall be recessed through the inside rear wall of the compartment to provide an easily accessible enclosure to house all of the body wiring junction points, terminal strips, solenoids, etc. The design of this compartment shall not decrease the storage capacity area of the compartment in which it is located. A removable panel shall be provided for access to this compartment.

PUMP ENCLOSURE WORK LIGHTS

Work lighting shall be provided inside the pump enclosure providing a minimum of 20 candlepower illumination.

ENGINE COMPARTMENT WORK LIGHTS

Work lighting shall be provided inside the engine enclosure that will provide a minimum of 20

candlepower illumination.

AMDOR LUMA BAR TRACK MOUNTED COMPARTMENT LIGHTS - LED

Each individual, equipment storage compartment shall be equipped with the AMDOR Luma Bar LED light fixture mounted one each side of the forward (and rear) vertical door frame.

NFPA LIGHTING PACKAGE

The following warning light package shall include all of the minimum warning light and actuation requirements for the current revision of the NFPA 1901 Fire Apparatus Standard. The lighting as specified shall meet the requirements for both "Clearing Right of Way" and "Blocking Right of Way" as noted.

LIGHT PACKAGE ACTUATION CONTROLS

The entire warning light package shall be actuated with a single warning light switch located on the cab switch panel. The wiring for the warning light package shall engage all of the lights required for "Clearing Right of Way" mode when the vehicle parking brake is not engaged. An automatic control system shall be provided to switch the warning lights to the "Blocking Right of Way" mode when the vehicle parking brake is engaged.

UPPER LEVEL LIGHTING - CODE 3

NFPA ZONE A, UPPER

A Code 3 # 2780NFPA1 P1 "RX 2700 Prizm II Series", 80" LED cab roof warning light bar shall be furnished and rigidly mounted on top of the cab roof. The lightbar shall be equipped with the following:

- Six Forward Facing Red - Eight LED Reflector Prizm II Modules
- Four Corners Red - Twelve LED Reflector Prizm II Modules.

The forward facing clear lights shall be disabled automatically for the "Blocking Right of Way" mode.

NFPA ZONE C, UPPER

Two (2) Code 3 85BZR surface mounted flashing LED lights shall be furnished and mounted one (1) each side at the rear, upper portion of the apparatus. Each light shall be furnished with a chrome-plated flange. A red lens shall be provided on each light.

NFPA ZONES B & D REAR, UPPER

Two (2) surface mounted Code 3 85BZR LED light heads shall be furnished and mounted one (1) each side on the upper side face, towards the rear of the body, facing to each side of the unit. Each upper rear LED light head shall be equipped with one **amber** lens on the left and one **blue** lens on the right both with a chrome plated flange.

NFPA ZONES B & D FRONT, UPPER

Two (2) surface mounted Code 3 85BZR LED light heads shall be furnished and mounted; one (1) each side on the upper side face, towards the front of the body, facing to each side of the unit. Each upper front LED light head shall be equipped with a red lens and chrome plated flange.

LOWER LEVEL LIGHTING - CODE 3

NFPA ZONE A, LOWER

Two (2) Code 3 # 65BZR flashing LED light heads shall be provided and installed one (1) each side. Each light shall be equipped with a red lens and chrome plated mounting flange.

The lower zone A warning lights shall be mounted in the custom chassis headlight bezels.

NFPA ZONE C, LOWER

Two (2) Code 3 #65BZR flashing LED light heads shall be provided and installed; one (1) each side directly below the DOT stop, tail, turn and backup lights. Each light shall be equipped with a red lens and chrome plated mounting flange.

NFPA ZONES B & D FRONT, LOWER

Two (2) Code 3 # 65BZR flashing LED light heads shall be provided and installed one (1) each side. Each light shall be equipped with a red lens and chrome plated mounting flange.

The lower zone B & D warning lights shall be mounted on the sides of the custom chassis front bumper.

NFPA ZONES B & D MIDSHIP, LOWER

Two (2) Code 3 # 65BZR flashing LED light heads shall be provided and installed one (1) each side. Each light shall be equipped with a red lens and chrome plated mounting flange.

NFPA ZONES B & D REAR, LOWER

Two (2) Code 3 # 65BZR flashing LED light heads shall be provided and installed one (1) each side. Each light shall be equipped with a red lens and chrome plated mounting flange.

WARNING LIGHT SYSTEM CERTIFICATION

The warning light system(s) specified above shall not exceed a combined total amperage draw of 45 AMPS with all lights activated in either the "Clearing Right of Way" or the "Blocking Right of Way" mode.

The warning light system(s) shall be certified by the light system manufacturer(s), to meet all of the requirements in the current revision of the NFPA 1901 Fire Apparatus Standard as noted in the General Requirements section of these specifications. The NFPA required "Certificate of Compliance" shall be provided with the completed apparatus.

AUXILIARY WARNING LIGHTS

Two (2) Code 3 model 798RBZ-75, surface mounted red LED lights shall be furnished and shall be mounted as high as possible on the side of the cab between the rear crew cab doors and the back wall of the cab.

The lights specified above shall be provided in addition to the NFPA required Optical Warning Light Package and shall be switched independently from the light package. Additionally, wiring for the independently switched lights specified, shall be run through the Load Management System to ensure that the electrical system is not overloaded by the additional amperage draw requirements.

ARROW STICK WARNING LIGHT

One (1) Code 3 LEDX, “Narrow Stik” Model #NASL847, 47” rear directional light shall be installed on the rear of the body, under the intermediate rear step to prevent damage. The light shall be equipped with eight (8) lamps. The light shall be controlled from the cab. The control module shall be conveniently located near the driver’s position. The rear directional light shall be wired through the load management system of the unit.

ELECTRIC HORN

A single electric horn activated by the steering wheel horn button shall be furnished.

A three (3) position rocker switch shall be installed on the cab dash to activate from the steering wheel horn button one of the following: DOT horn, air horn, or electronic/mechanical siren

BACK-UP ALARM

A Code 3, model #D450C, 87dBA back-up alarm, shall be provided and installed at the rear of the apparatus under the tailboard. The back-up alarm shall activate automatically when the transmission is placed in reverse gear and the ignition is "on".

AIR HORNS

Two (2) chrome plated air horns shall be at the front of the vehicle. The air horns shall be mounted in full compliance with NFPA-1901. The supply lines shall be dual 1/4" lines with equal distance from each horn.

Both air horns shall be recessed in the front bumper.

The air horn(s) shall be controlled by a foot switch on the officer's side and the steering horn button on driver's side. An air horn/electric DOT horn selector switch shall be furnished on the dash for the drivers steering horn button.

ELECTRONIC

One (1) Code 3 Model # 3692 V-Con electronic siren shall be provided featuring: electronic air horn, wail, yelp and hi-lo siren tones along with public address and radio rebroadcast. A hardwired microphone shall provided for the public address feature.

The electronic siren and speaker shall meet the NFPA required SAE certification to ensure compatibility between the siren and speaker.

One (1) Code 3, model # FM100C chrome plated siren speaker shall be provided, recessed in the front bumper and wired to the electronic siren.

FEDERAL Q2B MECHANICAL SIREN

One (1) Federal Model #Q2B mechanical siren shall be provided to provide audible warning.

The Q2B siren shall be wired through the load management system to prevent excessive amperage draw. The siren shall be provided in addition to the required minimum NFPA audible warning requirements.

The Q2-B siren shall be semi-recessed into the center of the front bumper. The siren shall be recessed so the front grille portion of the siren is exposed and protruding beyond the bumper.

Two (2) Linemaster #632 floor mounted foot switches shall be provided, one (1) for the officer and one (1) for the driver. A siren brake button shall be provided near the driver's position.

FIRECOM MODEL #3010 INTERCOM SYSTEM

A Firecom model # 3010 intercom system shall be provided in the front of the cab. The system shall be capable of interfacing with a two-way radio system (note: an authorized two-way radio installer shall be responsible for interfacing the intercom system with the two-way radio). The master station shall be capable of accepting up to six positions (plus exterior positions), and utilize a 12 volt nominal power supply. The unit shall have a touch screen adjustable volume control and have advanced noise reducing circuitry.

The intercom system shall include:

DRIVERS AND OFFICERS HEADSETS & BASE STATION FOR WIRELESS FIRECOM SYSTEM

Two (2) UHW-10 wireless under helmet radio transmit headsets, each with their own paired base station, shall be furnished for the driver and officer seating locations in the cab. The headsets shall have adjustable volume, noise-canceling electric microphone, adjustable head strap, a flex-style boom which rotates for left or right dress and a charging port to connect the 12 volt charger when the headset is not in use. The sets shall also have comfortable liquid foam ear seals.

The base station shall be connected via a 6 conductor flat RJ-6 cable to any headset port on the Firecom 3010 series intercom. The base station will provide full duplex audio communication between the wireless headset and the intercom as well as PTT communication through the apparatus mobile radio.

Two (2) rubber coated steel headset hanger hooks shall be furnished in the front section of the cab to hold the driver and offer intercom headsets while not in use.

RADIO INTERFACE CABLE

Three (3) radio interface cables, model # 110-5101-30 and three (3) extension cable model # 108-0086-00 shall be provided and installed from the firecom base unit to the area of where the mobile radio base station shall be mounted. The end of the cable that connects to the mobile radio shall be un-terminated and shall be the responsibility of the radio installer to provide and install the correct adapter to connect the cable to the mobile radio.

REAR JUMPSEAT HEADSETS

Four (4) UHW-20 wireless under helmet intercom headsets shall be furnished for four (4) rear jump seat locations. The intercom headsets shall have adjustable volume, noise-canceling electric microphone, adjustable head strap, a flex-style boom which rotates for left or right dress and a charging port to connect the 12 volt charger when the headset is not in use. The sets shall also have comfortable liquid foam ear seals.

WIRELESS BASE STATION

One (1) wireless, multiple channel, base station shall be provided and connected via a 6 conductor flat RJ-6 cable to any headset port on the main Firecom base station. The wireless base station shall provide full duplex audio communication between the wireless headset and the intercom.

Four (4) rubber coated steel headset hanger hooks shall be furnished to hold the intercom headsets while not in use.

WEATHER BAND AM/FM/CD RADIO

A Panasonic CQ-5302U Weather Band/AM/FM, CD, MP3, Satellite ready player shall be installed in the cab overhead panel as space allows. The speakers shall be located as follows:

- (2) JVC CS-V425 4 inch mounted in the Front of the cab
- (2) JVC CS-V625 6 inch mounted in the Rear of the cab

****** PUMP AND PLUMBING ******

PUMP

- **HALE QMAX-150**
- **1500 G.P.M.**
- **Single Stage**

The pump must deliver the percentage of rated capacity at the pressure listed below:

- 100% of rated capacity at 150 P.S.I. net pump pressure
- 100% of rated capacity at 165 P.S.I. net pump pressure
- 70% of rated capacity at 200 P.S.I. net pump pressure
- 50% of rated capacity at 250 P.S.I. net pump pressure

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

PUMP ASSEMBLY

The pump shall be of a size and design to mount on the chassis rails of commercial and custom truck chassis, and have the capacity of 1500 gallons per minute (U.S. GPM), NFPA-1901 rated performance.

PUMP CONSTRUCTION

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

The pump shall be driven by a drive line from the truck transmission. The engine shall provide sufficient horsepower and RPM to enable the pump to meet and exceed its rated performance.

The entire pump, both suction and discharge passages, shall be hydrostatically tested to a pressure of 600 PSI. The pump shall be fully tested at the pump manufacturer's factory to performance specs as outlined by the latest NFPA-1901. Pump shall be free from objectionable pulsation and vibration.

The pump body and related parts shall be of fine grain alloy cast iron with a minimum tensile strength of 30,000 PSI. All moving parts in contact with water shall be of high quality bronze or stainless steel. Pumps utilizing castings made of lower tensile strength cast iron are not acceptable.

Pump body shall be horizontally split, on a single plane in two sections for easy removal of entire impeller assembly including wear rings and bearings from beneath the pump without disturbing piping or the mounting of the pump in chassis.

PUMP SHAFT

Pump shaft to be rigidly supported by three bearings for minimum deflection. One high lead bronze sleeve bearing to be located immediately adjacent to the impeller (on side opposite the gearbox). The sleeve bearing is to be lubricated by a force fed, automatic oil lubricated design, pressure balanced to exclude foreign material.

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

PUMP IMPELLER

The pump shall have one double suction impeller. The pump body shall have two opposed discharge volute cutwaters to eliminate radial unbalance. (No exceptions)

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

Impeller clearance rings shall be bronze, easily renewable without replacing impeller or pump volute body, and of wrap-around double labyrinth design for maximum efficiency. (No exceptions.)

PUMP PACKING GLAND

The pump shaft shall have only one (1) packing gland located on inlet side of the pump. It shall be a split design for ease of repacking. The packing gland must be a full circle threaded design to exert uniform pressure on packing and to prevent cocking and uneven packing load when it is tightened. It shall be easily adjusted by hand with rod or screwdriver with no special tools or wrenches required. The packing rings shall be of a unique permanently lubricated, long life graphite composition and have sacrificial zinc foil separators to protect the pump shaft from galvanic corrosion.

PUMP DRIVE UNIT

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

Pump drive unit shall be of sufficient size to withstand up to 16,000 lbs. ft. of torque of the engine in both road and pump operating conditions. The drive unit shall be designed of ample capacity for lubrication reserve and to maintain the proper operating temperature.

The gearbox drive shafts shall be of heat treated chrome nickel steel and at least 2-3/4 inches in diameter on both the input and output drive shafts. They shall withstand the full torque of the engine in both road and pump operating conditions.

All gears, both drive and pump, shall be of the highest quality electric furnace chrome nickel steel. Bores shall be ground to size and teeth integrated, chrome-shaven and hardened, to give an extremely

accurate gear for long life, smooth, quiet running and higher load carrying capability. An accurately cut spur design shall be provided to eliminate all possible end thrust.

PUMP RATIO

The pump ratio shall be selected by the apparatus manufacturer to give maximum performance with the engine and transmission selected.

The manufacturer shall supply at time of delivery copies of the pump manufacturer's certification of hydrostatic testing, the engine manufacturer's current certified brake horsepower curve.

PUMP SHIFT CONTROL

The drive unit shall be equipped with a power shift. The shifting mechanism shall be a heat treated, hard anodized aluminum power cylinder with stainless steel shaft. An air operated in-cab control for rapid shift shall be provided that locks in road or pump, with a neutral position for use when manual override is required.

MAIN PUMP - PUMP SHIFT INDICATOR LIGHTS

For automatic transmissions, three (3) green warning lights shall be provided to indicate to the operator(s) when the pump has completed the shift for Road to Pump position. Two (2) green lights to be located in the truck driving compartment and one (1) green light on pump operator's panel adjacent to the throttle control. For manual transmissions, one (1) green warning light shall be provided for the driving compartment. All lights to have appropriate identification/instruction plates.

TRANSMISSION LOCK

The automatic transmission furnished in the chassis shall have a lock-up assembly which brings the transmission to direct drive and prevents the transmission from shifting gears while in the pumping mode.

BRAKING SYSTEM

A positive braking system shall be provided to prevent vehicle movement during pumping operations. The air brakes furnished must satisfy this requirement.

MAIN PUMP MOUNTS

Extra heavy duty pump mounting brackets shall be furnished. These shall be bolted to the frame rails in such a position to perfectly align the pump so that the angular velocity of the drive line joints shall be the same on each end of the drive shaft. This shall assure full capacity performance with a minimum of vibration. Mounting hardware shall utilize Grade 8 bolts.

Pumps which are not mounted directly to the frame will not be considered. Under no circumstance shall the pump function as a frame cross member.

******* PRESSURE CONTROL & ACCESSORIES *******

FIRE RESEARCH "IN-CONTROL" PRESSURE GOVERNOR

The apparatus shall be equipped with a Fire Research InControl series TGA300 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. 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 located on the front of the control panel. There shall be an 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.

AKRON INTAKE RELIEF VALVE

An Akron Model 59 intake relief valve system shall be plumbed on the suction side of the pump to comply fully with NFPA-1901 requirements. Excess pressures shall be plumbed to discharge water under the pump enclosure away from the pump operator.

PUMP CERTIFICATION

The pump shall be third party performance tested to meet the requirements of NFPA-1901. To ensure top quality and integrity, the test company shall be Underwriter's Laboratories (UL). NO EXCEPTIONS!

PRIMING PUMP

The priming pump will be a Trident air primer system. A push in primer handle will open the priming valve and prime the pump.

MASTER DRAIN VALVE

A rotary type, 12 port master drain valve shall be provided and controlled at the lower portion of the side pump panel. The valve shall be located in pump compartment lower than the main body and connected in such a manner as to allow complete water drainage of the pump body and all required accessories. Water shall be drained below the apparatus body and away from the pump operator.

INDIVIDUAL BLEEDERS AND DRAINS

All lines shall drain through the master drain valve or shall be equipped with individual drain valves, easily accessible and labeled.

One (1) individual "TRIDENT" quarter turn drain valve shall be furnished for each 1-1/2" or larger discharge port and each 2-1/2" gated auxiliary suction.

Drain/bleeder valves shall be located at the bottom of the side pump module panels.

All drains and bleeders shall discharge below the running boards.

SYNFLEX SUCTION, DISCHARGE, PRESSURE AND CONTROL LINES

Small lines within the pump enclosure shall be constructed from Synflex hose. Uses include, but are not limited to such lines as priming control, gauge lines, drain lines, air control valves, pump shift, supplemental cooling, foam flush and air bleeder valves.

PUMP MODULE

The pump module shall be a self-supported structure mounted independently from the body and chassis cab. The design must allow normal frame deflection without imposing stress on the pump module structure or side running boards. The pump module shall be securely mounted to the chassis frame rails.

The pump module shall be a welded frame work utilizing structural steel components properly braced to withstand the rigors of chassis frame flex.

DUNNAGE AREA

A dunnage area shall be provided above the pump enclosure for equipment mounting and storage. This area shall be furnished with a removable 3/16" aluminum tread plate floor and shall be enclosed on the sides.

NOTE: The size of this storage area may vary when top mounted crosslays, booster reel(s), etc., are specified and located in this area.

DRIVER SIDE PUMP PANEL ROLL-UP DOOR

The entire driver side pump panel shall be enclosed with a roll-up door. The roll-up door shall be mounted to aluminum framework, which shall extend to the edge of the running board step to allow maximum clearance behind the roll-up door. The framework shall be full width and height of the pump enclosure.

OFFICER SIDE PUMP PANEL ROLL-UP DOOR

The entire officer side pump panel shall be enclosed with a roll-up door. The roll-up door shall be mounted to aluminum framework, which shall extend to the edge of the running board step to allow maximum clearance behind the roll-up door. The framework shall be full width and height of the pump enclosure.

******* PUMP SUCTIONS & AUXILIARY INLETS *******

SUCTION INLETS

Two (2) 6" N.S.T. suction inlets shall be provided, one on the driver side and one on the officer side pump panel. A removable strainer shall be installed on each inlet.

INTAKE BUTTERFLY VALVE - ELECTRIC OPERATED

The fire pump shall be fitted with a Hale Master Intake Valve (MIV), on the driver side main suction inlet. The valve shall be mounted between the suction tube extension and the suction tube, and shall be recessed behind the operator's panel. The valve body and all related components that are in contact with water shall be manufactured of fine grained, corrosion resistant bronze. The valve shall have a bore of 6.40". The valve shall incorporate a pressure relief valve, set at the pump manufacturers facility to a rating of 125 PSI. The pressure relief valve shall provide protection for the suction hose even with the valve in the closed position. The valve shall incorporated a NFPA-1901 compliance, large diameter hose air bleed valve, controlled at the operator's panel.

The valve shall be operated by a twelve (12) volt DC motor, as standard. It shall also incorporate a hand wheel control manual override, mounted at the suction inlet. The electric control shall incorporate a placard with status lights to indicate whether the valve is in the closed, open or throttled position. The valve shall not be able to move from fully open to fully closed in under three (3) seconds, in compliance with NFPA-1901.

INTAKE BUTTERFLY VALVE - ELECTRIC OPERATED

The fire pump shall be fitted with a Hale Master Intake Valve (MIV), on the officer side main suction inlet. The valve shall be mounted between the suction tube extension and the suction tube, and shall be recessed behind the operator's panel. The valve body and all related components that are in contact with water shall be manufactured of fine grained, corrosion resistant bronze. The valve shall have a bore of 6.40". The valve shall incorporate a pressure relief valve, set at the pump manufacturers facility to a rating of 125 PSI. The pressure relief valve shall provide protection for the suction hose even with the valve in the closed position. The valve shall incorporated a NFPA-1901 compliance, large diameter hose air bleed valve, controlled at the operator's panel.

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PUMP SUCTION ENDS

The main pump suction inlets shall be furnished with a short suction end, terminating with only the suction threads protruding through the side panel to minimize the distance an exterior appliance protrudes beyond the pump panel.

One (1) 6” NSTF x %’ Stortz Kochek SKE-R-30° degree adapter and cap shall be provided installed on the driver and officer’s side main suction inlet.

AUXILIARY SIDE SUCTION(S)

One (1) 2-1/2" auxiliary suction shall be provided at the driver side pump panel, to the rear of the main inlet. The 2-1/2" auxiliary suction shall terminate with a removable strainer, chrome plated 2-1/2" NST female swivel with a chrome plated plug and retaining chain.

A 2 1/2" Akron #8800 series full flow, stainless steel ball valve shall be provided for the driver side rear auxiliary suction.

A 1/4 turn swing control handle shall be provide on the driver side rear auxiliary suction valve

One (1) 2-1/2" auxiliary suction shall be provided at the officer side pump panel, to the rear of the main inlet. The 2-1/2" auxiliary suction shall terminate with a removable strainer, chrome plated 2-1/2" NST female swivel with a chrome plated plug and retaining chain.

A 2 1/2" Akron # 8800 series full flow, stainless steel ball valve shall be provided for the officer side rear auxiliary suction.

A 1/4 turn swing control handle shall be provided on the officer side rear auxiliary suction valve.

All side gated inlet valves shall be recess mounted behind the side pump panels or body panels. NO EXCEPTIONS

TANK TO PUMP

One (1) 3" tank to pump line shall be piped through the front bulkhead of the tank with a 90 degree elbow down into the tank sump. This line shall be plumbed directly into the rear of the pump suction manifold for maximum efficiency.

A check valve shall be provided to prevent accidental pressurization of the water tank through the pump connection. Connection from the valve to the tank shall be made by using a non-collapsible flexible rubber hose.

A 3" Akron #8800 series full flow, stainless steel ball valve shall be provided between the pump suction manifold and the water tank.

A push/pull control handle shall be located on the operator's panel with function plate.

TANK FILL

One (1) 2 1/2" gated full flow pump to tank refill line controlled at the pump panel shall be provided. A deflector shield inside the tank shall be furnished. Tank fill plumbing shall utilize 2 1/2" high pressure hose for tank connection to accommodate flexing between components. (NO EXCEPTIONS)

A 2 1/2" Akron, #8800 series, full flow, stainless steel ball valve shall be provided between the pump discharge manifold and the water tank.

A push/pull control handle shall be located on the operator's panel with function plate.

******* DISCHARGES & ACCESSORIES -SIDE MOUNT *******

DRIVER'S SIDE MAIN DISCHARGE #1

A discharge shall be provided and located at the driver's side pump panel. The driver's side discharges #1 shall terminate with NST threads, through the left panel above the main pump intake.

The main pump discharge shall be plumbed directly from the pump discharge manifold utilizing direct connect discharge valve flanges.

A 2 1/2" Akron, #8800 series, full flow, stainless steel ball valve shall be provided for the driver's side #1 discharge. The valve shall be equipped with the Akron "Tork-Lok" feature.

The discharge valve shall be equipped with a straight 2 1/2" NST adapter that shall be equipped with a 2 1/2" NST, 30-degree, chrome plated elbow.

A 2 1/2 " NST chrome plated pressure vented cap shall be installed on driver's side #1 discharge.

One (1) 2-1/2" NSTF X 1-1/2" NSTM reducer w/cap(s) shall be provided on the driver's side # 1 discharge.

The driver's side #1 discharge valve shall be controlled by a push/pull handle located on the operator's panel.

The driver's side #1 discharge shall be equipped with a 2 ½ “ diameter Noshok pressure gauge. The 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 gauge 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.

The 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 gauge shall have black graphics on a white background.

DRIVER'S SIDE MAIN DISCHARGE #2

A discharge shall be provided and located at the driver's side pump panel. The driver's side discharges #2 shall terminate with NST threads, through the left panel above the main pump intake.

The main pump discharge shall be plumbed directly from the pump discharge manifold utilizing direct connect discharge valve flanges.

A 2 1/2" Akron, #8800 series, full flow, stainless steel ball valve shall be provided for the driver's side #2 discharge. The valve shall be equipped with the Akron "Tork-Lok" feature.

The discharge valve shall be equipped with a straight 2 1/2" NST adapter that shall be equipped with a 2 1/2" NST, 30-degree, chrome plated elbow.

A 2 1/2" NST chrome plated pressure vented cap shall be installed on driver's side #2 discharge.

A 2-1/2" NSTF X 1-1/2" NSTM reducer w/cap shall be provided on the driver's side # 2 discharge.

The driver's side #2 discharge valve shall be controlled by a push/pull handle located on the operator's panel.

The driver's side #2 discharge shall be equipped with a 2 ½ " diameter Noshok pressure gauge. The 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 gauge 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.

The 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 gauge shall have black graphics on a white background.

OFFICER'S SIDE MAIN DISCHARGE #1

A discharge shall be provided and located at the officer's side pump panel. The officer's side discharges #1 shall terminate with NST threads, through the officer's side panel above the main pump intake.

The main pump discharge shall be plumbed directly from the pump discharge manifold utilizing direct connect discharge valve flanges.

A 4" Akron, #8840 series, full flow, flat ball valve shall be provided for the officer's side #1 discharge.

The discharge valve shall be equipped with a straight 4" NST adapter that shall be equipped with a 4" NST, 30-degree, chrome plated elbow.

The officer's side #1 discharge cap provided as standard equipment shall be deleted.

A 4" NSTF X 5" Storz Kochek S37S straight adapter w/cap shall be provided on the officer's side #1 discharge.

The officer's side #1 discharge valve shall be equipped with an Akron Brass Style 9313 Valve Controller. The electric controls must be of current limiting design, requiring no clutches in the motor. The unit must have booted switches with momentary open and close as well as an optional one touch full open feature to operate the actuator. The unit must provide position indication through 10 LED light indicators for maximum visibility.

The officer's side #1 discharge shall be equipped with a 2 ½ " diameter Noshok pressure gauge. The 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 gauge 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.

The 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 gauge shall have black graphics on a white background.

OFFICER'S SIDE MAIN DISCHARGE #2

A discharge shall be provided and located at the officer's side pump panel. The officer's side discharges #2 shall terminate with NST threads, through the officer's side panel above the main pump intake.

The main pump discharge shall be plumbed directly from the pump discharge manifold utilizing direct connect discharge valve flanges.

A 2 1/2" Akron, #8800 series, full flow, stainless steel ball valve shall be provided for the officer's side #2 discharge. The valve shall be equipped with the Akron "Tork-Lok" feature.

The discharge valve shall be equipped with a straight 2 1/2" NST adapter that shall be equipped with a 2 1/2" NST, 30-degree, chrome plated elbow.

A 2 1/2" NST chrome plated pressure vented cap shall be installed on officer's side #2 discharge.

A 2-1/2" NSTF X 1-1/2" NSTM reducer w/cap shall be provided on the officer's side #2 discharge.

The officer's side #2 discharge valve shall be controlled by a push/pull handle located on the operator's panel.

The officer's side #2 discharge shall be equipped with a 2 ½ " diameter Noshok pressure gauge. The 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 gauge 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.

The 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 gauge shall have black graphics on a white background.

OFFICER SIDE REAR DISCHARGE

A 2 1/2" NST rear discharge shall be provided at the rear of the vehicle, plumbed from the pump.

The rear discharge shall terminate on the rear body panel, on the officer side of the body.

The officer side rear discharge pipe shall be equipped with a chrome 2 1/2" NSTM thread adapter.

The officer side rear discharge shall be plumbed utilizing 2 1/2" schedule 40, galvanized steel piping, 45 degree threaded elbows and a limited number of 90 degree sweep elbows in an assembly from the pump to the rear of the vehicle.

A minimum of one (1) grooved pipe shall be furnished in this assembly to allow for flex and serviceability.

A 2 1/2" Akron, #8800 series, full flow, stainless steel ball valve shall be provided for the officer side rear discharge. The valve shall be equipped with the Akron "Tork-Lok" feature.

The officer side rear discharge valve shall be controlled by a push/pull handle located on the operator's panel.

One (1) 2 1/2" NST chrome plated pressure vented cap(s) shall be installed at the officer side rear discharge.

The officer side rear discharge shall be equipped with a 2 ½ “ diameter Noshok pressure gauge. The 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 gauge 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.

The 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 gauge shall have black graphics on a white background.

DECK GUN DISCHARGE

A deck gun discharge shall be plumbed from the pump to an area on top of the vehicle. The deck gun piping shall be firmly supported and braced.

The deck gun discharge shall be located in the dunnage area above the pump module on the officer's side of the vehicle. A pedestal type, 1/4" steel plate support assembly shall be provided to stabilize deck gun plumbing below deck gun mount flange.

The deck gun discharge pipe shall terminate with 3" NPT threads.

To improve the operation range of the deck gun, the discharge pipe shall be outfitted with an electric TFT (18") Extend-A-Gun RC3, part # XGA38VL-RL. The electric Extend-A-Gun shall be equipped with a up/down control located on the pump operator's panel. The Extend-A-Gun shall be wired to the hazard light on the cab dash.

The deck gun piping shall be designed so the overall height of the deck gun in the mounted/stowed position does not exceed the tallest point on the cab/body.

The deck gun discharge shall be plumbed utilizing 3" schedule 40, galvanized piping, 45 degree threaded elbows and a limited number of 90 degree sweep elbows in an assembly from the pump to the deck gun location.

A minimum of one (1) grooved pipe coupling shall be furnished in this assembly to allow for flex and serviceability.

A 3" Akron, #8800 series, full flow, stainless steel ball valve shall be provided for the deck gun discharge. The valve shall be equipped with the Akron "Tork-Lok" feature.

The deck gun discharge valve shall be controlled by a push/pull handle located on the operator's panel.

The deck gun discharge shall be equipped with a 2 ½" diameter Noshok pressure gauge. The 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 gauge 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.

The 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 gauge shall have black graphics on a white background.

TFT ELECTRIC DECK GUN

A TFT Hurricane RC monitor shall be supplied and mounted on the deck gun discharge of the unit to provide the maximum travel clearance. The monitor shall be controlled from the pump operator's panel.

TFT MASTER STREAM NOZZLE

A TFT model "MASTER STREAM" 1000 g.p.m. electric nozzle shall be supplied with the deck gun.

TFT STACKED TIPS

A set of TFT stacked tips and stream straightener shall be provided with the monitor.

TFT OPERATOR STATION

The electric deck gun shall be controlled using a TFT panel mount controller.

TFT OPERATOR STATION

The electric deck gun shall be controlled using a TFT wireless controller.

FRONT DISCHARGE

A 1 1/2" front #1 discharge shall be plumbed to the front bumper of the vehicle.

The front #1 discharge shall terminate through the rear wall of the hose well on the officer's side. The front discharge pipe shall be equipped with a chrome 1 ½" NSTM straight adapter.

The front #1 discharge shall be plumbed utilizing 2" schedule 10, stainless steel piping, 45 degree threaded elbows and a limited number of 90 degree sweep elbows in an assembly from the pump to the front of the vehicle.

A minimum of one (1) grooved pipe coupling shall be furnished in this assembly to allow for flex and serviceability. Automatic discharge drains shall be provided at all low points in the plumbing.

A 2" Akron, #8800 series, full flow, stainless steel ball valve shall be provided for the front #1 discharge. The valve shall be equipped with the Akron "Tork-Lok" feature.

The front #1 discharge valve shall be controlled by a push/pull handle located on the operator's panel.

A 1 1/2" NST chrome plated pressure vented cap shall be installed the front #1 discharge.

The front #1 discharge shall be equipped with a 2 ½ " diameter Noshok pressure gauge. The 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 gauge 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.

The 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 gauge shall have black graphics on a white background.

HORIZONTAL CROSSLAY #1

A crosslay hose bed shall be provided and plumbed from the pump in a transverse design, located above the pump enclosure for quick attack deployment. The crosslay hose bed flooring shall be designed to be removable, constructed from brushed finish, perforated aluminum material.

Crosslay #1 shall be designed to have a minimum total capacity of 3.5 cubic feet as required by NFPA -1901 to accommodate a minimum of 200 feet of 1-3/4" fire hose.

Crosslay #1 hosebed shall be designed to accommodate the fire hose in a double stack configuration.

The crosslay discharge shall terminate below the hosebed floor with a 1 1/2" NSTM chicksan swivel adapter. The crosslay hose bed floor shall be slotted to allow the swivel to extend up through the floor, allowing the pre-connected hose to be pulled off either side of the apparatus without kinking the hose at the coupling connection.

The crosslay #1 discharge shall be plumbed utilizing 2" schedule 10, stainless steel piping and/or flexible hose, 45 degree threaded elbows and a limited number of 90 degree sweep elbows in an assembly from the pump to crosslay hosebed.

A minimum of one (1) grooved pipe coupling shall be furnished in this assembly to allow for flex and serviceability.

A 2" Akron, #8800 series, full flow, stainless steel ball valve shall be provided for the crosslay #1 discharge. The valve shall be equipped with the Akron "Tork-Lok" feature.

The crosslay #1 discharge valve shall be controlled by a push/pull handle located on the operator's panel.

The crosslay #1 discharge shall be equipped with a 2 ½ " diameter Noshok pressure gauge. The 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 gauge 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.

The 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 gauge shall have black graphics on a white background.

HORIZONTAL CROSSLAY #2

A crosslay hose bed shall be provided and plumbed from the pump in a transverse design, located above the pump enclosure for quick attack deployment. The crosslay hose bed flooring shall be designed to be removable, constructed from brushed finish, perforated aluminum material.

Crosslay #2 shall be designed to have a minimum total capacity of 3.5 cubic feet as required by NFPA -1901 to accommodate a minimum of 200 feet of 1-3/4" fire hose.

Crosslay #2 hosebed shall be designed to accommodate the fire hose in a double stack configuration.

The crosslay discharge shall terminate below the hosebed floor with a 1 1/2" NSTM chicksan swivel adapter. The crosslay hose bed floor shall be slotted to allow the swivel to extend up through the floor, allowing the pre-connected hose to be pulled off either side of the apparatus without kinking the hose at the coupling connection.

The crosslay #2 discharge shall be plumbed utilizing 2" schedule 40, galvanized piping and/or flexible hose, 45 degree threaded elbows and a limited number of 90 degree sweep elbows in an assembly from the pump to crosslay hosebed.

A minimum of one (1) grooved pipe coupling shall be furnished in this assembly to allow for flex and serviceability.

A 2" Akron, #8800 series, full flow, stainless steel ball valve shall be provided for the crosslay #2 discharge. The valve shall be equipped with the Akron "Tork-Lok" feature.

The crosslay #2 discharge valve shall be controlled by a push/pull handle located on the operator's panel.

The crosslay #2 discharge shall be equipped with a 2 ½ " diameter Noshok pressure gauge. The 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 gauge 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.

The 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 gauge shall have black graphics on a white background.

HORIZONTAL CROSSLAY #3

A crosslay hose bed shall be provided and plumbed from the pump in a transverse design, located above the pump enclosure for quick attack deployment. The crosslay hose bed flooring shall be designed to be removable, constructed from brushed finish, perforated aluminum material.

Crosslay #3 shall be designed to have a minimum total capacity of 3.5 cubic feet as required by NFPA -1901 to accommodate a minimum of 200 feet of 2 1/2" fire hose.

Crosslay #3 hosebed shall be designed to accommodate the fire hose in a double stack configuration.

The crosslay discharge shall terminate below the hosebed floor with a 2 1/2" NSTM chicksan swivel adapter. The crosslay hose bed floor shall be slotted to allow the swivel to extend up through the floor, allowing the pre-connected hose to be pulled off either side of the apparatus without kinking the hose at the coupling connection.

The crosslay #3 discharge shall be plumbed utilizing 2 1/2" schedule 10, stainless steel piping and/or flexible hose, 45 degree threaded elbows and a limited number of 90 degree sweep elbows in an assembly from the pump to crosslay hosebed.

A minimum of one (1) grooved pipe coupling shall be furnished in this assembly to allow for flex and serviceability.

A 2 1/2" Akron, #8800 series, full flow, stainless steel ball valve shall be provided for the crosslay #3 discharge. The valve shall be equipped with the Akron "Tork-Lok" feature.

The crosslay #3 discharge valve shall be controlled by a push/pull handle located on the operator's panel.

The crosslay #3 discharge shall be equipped with a 2 ½ " diameter Noshok pressure gauge. The 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 gauge 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.

The 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 gauge shall have black graphics on a white background.

The crosslay hose bed floor will be approximately 42" above the side running board and no more than 66" above ground level.

******** CONCENTRATE PIPING & FOAM SYSTEM ********

FOAM PIPING

All foam concentrate plumbing from the tank or auxiliary foam inlet to the foam system components shall be stainless steel.

The foam system piping shall incorporate a check valve to prevent water from entering the foam tank; the discharge piping shall also include a check valve to prevent foam solution from back feeding into the discharge side of the pump. Individual discharge piping shall be as specified for each discharge.

The complete foam system shall be tested in accordance with Chapter 17 of NFPA-1901.

FOAMPRO FOAM INJECTION SYSTEM

A FoamPro model 1601, electronic, fully automatic, variable speed, direct injection, discharge side foam proportioning system shall be installed in the pumping system. The system shall be capable of handling Class "A" foam concentrate. The foam proportioning operation shall be based on direct measurement of water flows, and remain consistent within the specified flows and pressures. System shall be capable of delivering accuracy to within 3% of calibrated settings over the advertised operation range when installed according to factory standards. The system shall be equipped with a control module suitable for installation on the pump panel. Incorporated within the motor driver shall be a microprocessor that receives input from the system flowmeter, while also monitoring foam concentrate pump output, comparing values to ensure that the operator preset proportional amount of foam concentrate is injected into the discharge side of the fire pump. A paddlewheel-type flowmeter shall be installed in the discharge or manifold system specified to be “foam capable.”

A 12 or 24-volt electric motor driven positive displacement plunger pump shall be provided. The pump capacity shall be 1.0 GPM (3.8 L/min) at 200 psi (13.8 BAR) with a maximum operating pressure up to 400 psi (27.6 BAR). The system shall draw a maximum of 30 amps @ 12 VDC or 15 amps @ 24 VDC. The motor shall be controlled by the microprocessor (mounted to the base of the pump). It shall receive signals from the control module and power the 1/3 hp (.25 Kw) electric motor in a variable speed duty cycle to ensure that the correct proportion of concentrate is injected into the water stream. A full flow check valve shall be provided in the discharge piping to prevent foam contamination of fire pump and water tank. A 5 psi (.35 BAR) opening pressure check valve shall be provided in concentrate line.

The control module shall enable the pump operator to:

- Activate the foam proportioning system
- Select proportioning rates from 0.1% to 1.0%
- See a “low concentrate” warning light flash when the foam tank runs low and in two minutes, if foam concentrate is not added to the tank, shut the foam concentrate pump down

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

- Operator control module
- Paddlewheel flowmeter
- Pump and electric motor/motor driver
- Wiring harnesses
- Low-level tank switch
- Foam injection check valve
- Main waterway check valve

Accurate concentration proportioning can be achieved, based on the following water flows:

- 100 GPM water 1.0% concentration, class A
- 200 GPM water 0.5% concentration, class A
- 500 GPM water 0.2% concentration, class A

Note: Multiple discharges plumbed to this system may affect performance if the flow rates are exceeded by any one discharge or the totality of multiple discharges at one time!

The discharge piping shall be equipped with a properly sized flowmeter sensor, based on the systems capabilities.

The foam system shall be plumbed to the following discharge/s through the discharge piping or manifold system:

- Crosslay #1 discharge.
- Crosslay #3 discharge.
- Front discharge.

FOAMPRO POWER-FILL

The apparatus shall be equipped with an electronic, automatic, concentrate refill system. System shall operate independently of the foam proportioner allowing simultaneous use. Refill operation shall not require apparatus or fire pump to be running. The system shall be capable of handling Class A or Class B foam concentrates, emulsifiers, gels and decontamination concentrates. The apparatus shall be plumbed from the externally accessed intake/flush ports to the concentrate cell following manufacturer's recommendations. The external fill and flush connections to be quick-connect, cam-lock type. Internal piping to incorporate check valves to prevent back flow. Concentrate tank inlet shall be positioned to minimize agitation per manufacturers recommendations. The refill operation shall be based on direct measurement of concentrate level in tank. System must be capable of automatically stopping when cell is full and include a manual override feature. The system shall be equipped with an electronic control suitable for installation on the pump panel. Incorporated within the control shall be a microprocessor that receives input from the system while controlling foam concentrate pump output. An all bronze three-way valve shall be included to allow the operator to flush system after use. Valve control, intake and flush ports shall be located within corresponding panel plate.

The system shall enable the operator to perform the following control/operation functions and status indicators for the refill operation:

- Provide push-button start/stop control of foam refill
- Solid green light advises operator concentrate cell is full
- Flashing green indicates system is running
- Green light off, system off
- Allow override of "full tank" condition
- Provide a means to flush the pump and intake piping

System shall include a 12 or 24-volt electric motor driven, positive displacement concentrate pump. Pump shall deliver minimum flow of 10 GPM (37.8 L/min) @ 20 psi with all concentrates currently utilized in fire apparatus. Pump body to be of all bronze construction and other wetted components and piping to be constructed of non-corrosive materials. The system shall draw a maximum of 38 amps @ 12 VDC or 19 amps @ 24 VDC. A pump/motor solenoid (mounted to the base of the pump) shall receive signals from the computer control display and power the 1/2 hp (0.4 Kw) electric motor directly coupled to the concentrate pump. The system shall receive readings when the concentrate tank is full and stop operation to prevent overfill.

Components of the complete refill system shall include:

- Operator control and display with Weather-Pac connectors
- Refill/flush quick-connect cam-lock fittings and cap
- Check valves
- Pump/motor assembly and solenoid
- Strainer
- Tank level switch
- Three-way fill/flush valve
- Stainless steel pick-up wand and 6 feet of reinforced suction hose, 1 in diameter to allow maximum flow
- Panel placards

FOAM CONCENTRATE

The foam system shall be capable of injecting the following foam concentrates:

- Class A - Responder by Kidde Fire Fighting / National Foam.
- **No Class B foam selected or Class B foam system present.**

****** PUMP PANEL & ACCESSORIES *******

PUMP PANEL - SIDE MOUNT

The pump operator's control panel shall be located on the driver side of the apparatus. The pump enclosure side panels shall be completely removable and designed for easy access and servicing.

PUMP PANEL MATERIAL

The left side operator's panel, gauge panel, right side pump panel and right side access door shall be fabricated from 14-gauge 304L stainless steel with a #4, (150/180 grit), standard brushed finish.

HINGED GAUGE PANEL

A full width, vertically hinged gauge access panel shall be provided at the operator's position. Chrome plated positive locks shall be provided along with chain holders to prevent the front of the gauge panel from coming in contact with other panels when open.

HINGED PUMP ACCESS DOOR OFFICER SIDE

A 16" high by a minimum of 30" wide pump enclosure access door shall be provided above the officer's side pump panel. This door shall have a "D" ring, two-point latch mechanism and two (2) gas shock stay arms for ease of access.

VERTICALLY HINGED PUMP PANEL OFFICER SIDE

The low section of the officer's side pump panel shall be vertically hinged to provide complete access to the pump and plumbing on the officer's side of the pump enclosure. The panel shall be equipped with a stainless steel hinge and secured with push type locks to hold the panel closed. The drains located on the officer's side panel shall be fastened to the lower 6" of the panel, which shall be stationary.

PANEL FASTENERS

Stainless steel machine screws and lock washers shall be used to hold these panels in position. The panels shall be easily removable to provide complete access to the pump for major service.

CAPS AND ADAPTERS SAFETY TETHER

All applicable discharge and suction caps, plugs and adapters shall be equipped with chrome plated ball chain or double looped coil chain and secured to the vehicle.

PUMP PANEL TRIM PLATES

A high polish stainless steel trim plate shall be provided around each discharge port and suction inlet opening to allow accessibility to the respective valve for service and repairs.

DISCHARGE GAUGE TRIM BEZELS

Each individual discharge gauge shall be installed into a decorative chrome-plated mounting bezel that incorporates valve-identifying verbiage and color labels.

COLOR CODED IDENTIFICATION TAGS

Color coded identification tags shall be provided for all gauges, controls, connections, switches, inlets and outlets.

PUMP OPERATOR'S PANEL LIGHT SHIELD

The pump operators panel shall be equipped with a light shield that shall be full width of the control panel, and shall be positioned to cover the lights and prevent glare.

The light shield shall be equipped with the following lights:

- Amdor Luma Bar H2O super bright LED strip lights.

OFFICER SIDE PANEL LIGHTING

The officer's side pump panel and running board shall be illuminated by the following lights:

- Four (4) Whelen #OAC0EDCR 45 degree LED illumination lights
  The lights shall be switched with the main pump panel lights.

PUMP OPERATOR'S PANEL

Particular attention is to be given to functional arrangement of all controls. The pump operator's panel shall accommodate the following:

- Hinged gauge panel
- Water tank fill valve
- Auxiliary suction valve control
- All discharge valve controls
- Auxiliary engine cooler controls
- Water tank suction control valve
- Pump primer valve
- Engine throttle control
- Master compound vacuum gauge
- Master pressure gauge
- Individual discharge gauges
- Pump shift engaged indicator light
- Water tank water level indicator
- Engine tachometer
- Engine oil pressure gauge with audible alarm
- Engine water temperature gauge with audible alarm
- Low voltage light and audible alarm
- Pump panel light switch
- Speed counter (Underwriters)
- Pump performance plate (Underwriters)
- Pump serial No. plate
- Master pump drain valve
- Individual drains
- Voltmeter
- Air inlet/outlet at lower driver side panel
- Pump panel air horn actuation button
- 1/2" Pump cooler (By-pass Line)
- Fire Research #TGA300 "IN CONTROL" pressure governor control

PUMP TEST PORTS

The pump panel shall be equipped with Vacuum & Pressure test plugs to allow for test equipment

to monitor pump pressure and vacuum levels. Chrome plugs and labels shall be provided for the test ports.

MASTER GAUGES

One (1) 4" diameter pressure gauge (labeled: "PRESSURE") and one (1) 4" diameter compound vacuum gauge (labeled: "INTAKE") shall be provided. The master gauges shall be "No Shok"**,** silicone filled. The gauge faces shall be white with black numerals.

PRESSURE & COMPOUND GAUGE RANGES

All applicable pressure gauges shall have a range of 0 - 400 P.S.I., and the compound gauge shall have a range of -30" - 0 - 400 P.S.I.

ENGINE COOLER

An auxiliary cooler or heat exchanger shall be installed in the engine compartment between the engine and the chassis radiator. The cooler shall permit the use of water from the pump for cooling system. The cooling shall be done without mixing engine and pump water.

TANK LEVEL GAUGE

A Fire Research, model #WLA200-A00, "TANKVISION" gauge that shows the actual volume of water in the tank shall be provided on the pump operator's panel. The "TANKVISION" gauge is designed for both ease of operation and installation. The "TANKVISION" gauge utilizes ultra bright LEDs for sunlight readability and also uses 2 specially designed wide-viewing lens for 180° of clear viewing. The "TANKVISION" gauge utilizes a pressure sender to measure the liquid volume. The gauge shall be equipped self-calibration feature allows the LED's TANKVISION gauge to be used on tanks of different shapes and sizes.

Features:

- Flashes warning when the volume is less than 25%. Rapid down scrolling LED's alert the operator when the tank is almost empty. Remote audio warning available
- One size fits all'. The self-calibration feature allows for easy calibration of any shape or size tank
- Multiple displays are possible with a single sender through the FRC data bus
- Rugged waterproof cast aluminum housing
- No fitting needed for poly tank.
- Special fittings available for other tank materials.
- Connector disconnects at back of display

The gauge shall use a pressure transducer installed near the bottom of the water tank to determine the correct volume in the tank.

A Fire Research model #WLA290, remote relay module shall be provided to provide outputs for large indicator lights on the side of the vehicle.

LARGE LIGHT WATER LEVEL GAUGE, EACH SIDE OF CAB

A large light water level gauge system shall be provided on both sides of the cab. Each side shall be provided with a Whelen model PSTANK, LED strip light mounted behind the rear crew door above the handrail. The lights shall be surface mounted on the sides of the cab.

The lights shall be mounted as to indicate the following water levels:

- Top light with green lens — Full tank
- Second light with blue lens — 3/4 tank
- Third light with amber lens — 1/2 tank
- Fourth light with red lens — 1/4 tank

The fourth light shall burn steady red to indicate 1/4 tank and shall start to flash when the water level drops below 1/4 tank. To prevent distraction to drivers, this tank level gauge shall be wired to display only when the park brake is engaged.

FOAM TANK LEVEL GAUGE - FOAM TANK "A"

A Fire Research, model #WLA260-A00, "TANKVISION" gauge that shows the actual volume of foam in the tank shall be provided on the pump operator's panel. The "TANKVISION" gauge is designed for both ease of operation and installation. The "TANKVISION" gauge utilizes ultra bright LED's for sunlight readability and also uses 2 specially designed wide-viewing lens for 180° of clear viewing. The "TANKVISION" gauge utilizes a pressure sender to measure the liquid volume. The gauge shall be equipped self-calibration feature allows the TANKVISION gauge to be used on tanks of different shapes and sizes.

The gauge shall use a pressure transducer installed near the bottom of the foam tank to determine the correct volume in the tank.

WATER TANK

The water tank shall have a capacity of 750 gallons, constructed from Poly material.

FOAM TANK "A"

In addition to the water capacity of the tank, a 25 gallon integral foam storage area shall be built into the water tank. The foam tank shall have a latched fill tower, properly labeled as the foam fill point. A valved drain shall be provided.

TANK CONSTRUCTION

The Poly water tank shall be constructed from 1/2" thick polypropylene sheet stock. This material shall be a non corrosive stress relieved thermo-plastic, natural in color, and U.V. stabilized for maximum protection.

The water and foam tanks shall be of a specific configuration and shall also designed to be completely independent of the body and compartments. All joints and seams shall be nitrogen welded and tested for maximum strength and integrity. The top of the booster tank shall be fitted with removable lifting eyes designed with a 3 to 1 safety factor to facilitate easy removal. The transverse swash partitions shall be manufactured of 3/8" polypropylene (natural in color) and extend from approximately 4" off the floor to just under the cover. The longitudinal swash partitions shall be constructed of 3/8" polypropylene (natural in color) and extend from the floor of the tank through the cover to allow for positive welding and maximum integrity. 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 welded to each other as well as to the walls of the tank.

TANK LID

The tank cover shall be constructed of 1/2" thick polypropylene, natural in color, and U.V. stabilized, to incorporate a multi three-piece design, which allows for individual removal and inspection if necessary. The tank cover shall be recessed 3/8" from the top of the tank and shall be welded to both sides and longitudinal partitions for maximum integrity. Each one of the covers shall have hold downs consisting of 2" polypropylene dowels spaced a maximum of 30" apart. These dowels shall extend through the covers and become welded to the transverse partitions. This shall assist in keeping the cover rigid under fast filling conditions. A minimum of two lifting dowels shall be drilled and tapped 1/2" X 13" to accommodate the lifting eyes.

TANK FILL TOWER

The tank shall have a combination vent and manual fill tower. The fill tower shall be constructed of 1/2" polypropylene and shall be a minimum dimension of 8" x 8" outer perimeter. The tower shall be located in the left front corner of the tank unless otherwise specified be the purchaser in Special Provisions. The tower shall have a 1/4" thick removable polypropylene screen and a polypropylene hinged type cover. The fill tower cover shall be marked as a water tank fill point.

OVERFLOW AND VENT PIPE

The fill tower shall be fitted with an integral 4" I.D. schedule 40 P.V.C. combination overflow/vent pipe running from the fill tower through the tank to a 4" coupling flush mounted into the bottom of the tank to allow water to overflow behind the chassis rear axle.

TANK SUMP

The tank sump shall be a minimum of 10" wide x 10" long x 3" deep. An anti-swirl plate shall be mounted inside the sump, approximately 1" above the bottom of the sump.

TANK SUMP CONNECTION

The front bulkhead of the water tank shall be fitted with one (1) tank sump. A 3" drain plug shall be provided.

OUTLETS

There shall be two (2) standard tank outlets; one for tank-to-pump suction line which shall be a minimum of 4" coupling and one for a tank fill line which shall be a minimum of a 2" N.P.T. coupling. All tank fill couplings shall be backed with flow deflectors to break up the stream of water entering the tank.

TANK MOUNTING

The tank shall rest on the body cross members spaced a maximum of 22" apart, and shall be insulated from these cross members with a minimum of 3/8" nylon webbing or 1/2" rubber, 2-1/2" wide. The tank shall sit cradle-mounted using four (4) corner angles of 6 x 6 x 4 x 0.250 welded directly to the body cross members. The angles shall keep the tank from shifting left to right or front to rear. The tank is designed on the free-floating suspension principle and shall not require the use of hold downs. The tank shall be completely removable without disturbing or dismantling the apparatus body structure. The body or hose bed cross braces shall act as water tank retainers.

APPARATUS BODY DESIGN CONSTRUCTION

The body side and compartment assemblies shall be designed and assembled to provide maximum strength and durability under all operating conditions.

Special attention shall be taken to minimize corrosion on all fabricated parts and structural members of the body. All bolt-on components shall be provided with a dissimilar metals isolation barrier to prevent electric corrosion. The body design shall also incorporate removable panels to access spring hangers, rear body mounts and fuel tank sending units.

The body assembly shall be an all-welded configuration. The body shall be completely isolated from the cab and pump module structure.

BODY AND COMPARTMENT FABRICATION - 3/16" ALUMINUM

All compartment panels and body side sheets shall be entirely 3/16" aluminum (5052-H32). Each side compartment assembly shall be both plug welded and stitch welded to ensure proper weld penetration on all panels while avoiding the possible warping caused by a full seam weld. The side compartments shall be welded on a fixture to ensure true body dimensions of all door openings. The side compartments and body side panels are then set into a body squaring fixture where the super structure is installed and the entire body is aligned to be completely symmetrical. The super structure is then welded to the compartment side panels and reinforcement plates are inserted which allows the compartment panels to become an integral component of the body support structure. A full seam weld shall not be used due to the applied heat which shall distort sheet metal and remove the protective coating from the perimeter of the welded area. All seams shall be caulked prior to finish paint to ensure proper

compartment seal.

100" WIDE FIRE BODY

The fire body shall be 100" wide to provide the maximum amount of usable hose bed space, approximately 76" wide, and to extend the body fenderettes outward for better tire tread coverage.

SUPER STRUCTURE - ALUMINUM

The body super structure shall be an all welded configuration utilizing a combination of 3” x 1-1/2” 6061-T6 thick walled structural tubing and 6061 structural channel.

This structure shall be designed to totally support the full length and width of the body and shall be welded to the body side compartments by use of reinforcement plates to incorporate the compartments into an integral part of the body weldment.

The super structure shall be bolted to the sides of the chassis frame at four (4) points.

STEPPING, STANDING, & WALKING SURFACES

All stepping, standing, and walking surfaces on the body shall meet NFPA #1901 anti-slip standards. Aluminum tread plate utilized for stepping, standing, and walking surfaces shall be Alcoa No Slip type. This material shall be certified to meet the NFPA #1901 standard. Upon request by the Purchaser, manufacturer shall supply proof of compliance with this requirement. (There shall be No Exceptions allowed for this paragraph)

DRIVER'S SIDE COMPARTMENTATION

One (1) full height compartment shall be provided forward of the rear wheels, measuring 66" high x 64" wide with a single roll-up door opening 62" high x 61" wide.
One (1) full height compartment shall be provided to the rear of the rear wheels, measuring 66" high x 64" wide with a single roll-up door opening 62" high x 61" wide.

One (1) equipment compartment shall be provided above the rear wheels, measuring 34" high x 59" wide with a single roll-up door opening 30" high x 53" wide.

The driver's side body compartments shall be 26" deep for the full height of the compartments.

OFFICER'S SIDE COMPARTMENTATION

One (1) full height compartment shall be provided forward of the rear wheels, measuring 72" high x 64" wide with a single roll-up door opening 68" high x 61" wide.

One (1) full height compartment shall be provided to the rear of the rear wheels, measuring 72" high x 64" wide with a single roll-up door opening 68" high x 61" wide.

One (1) equipment compartment shall be provided above the rear wheels, measuring 36" high x 59" wide with a single roll-up door opening 32" high x 53" wide.

The officer's side body compartments shall be 26" deep for the full height of the compartments.

BODY ROOF COMPARTMENTS (DRIVER'S SIDE)

Roof hatch style compartments shall be provided the full length of the body, on the driver's side of the body hose bed area and shall be designed as an integral extension of the lower side compartments with a painted exterior finish. Drain tubes shall be provided at each end of each side compartment which shall extend down through the lower compartments.

Each side roof compartment shall extend the length of the body, which shall be evenly divided into three (3) individually accessed areas, which shall be open through from the front to the rear. The compartment depth shall extend from the ceiling area of the upper side compartments to the top of the body. The interior compartment width of each side roof compartment shall be a minimum of 25-1/2" inside width with a 22" wide access door at the top.

Each roof compartment shall be equipped with an overlapping, hinged lift up tread plate door. These doors shall be constructed of 3/16" aluminum tread plate with a 15 degree break on all sides. Each door shall have two (2) gas shock style stay open devices which shall also retain the door in the closed position. Each compartment door shall be equipped with a compartment light, a door button switch and a floor drain with a plastic tube to direct the water below the body.

Protective panels shall be applied inside the compartments to cover any exposed wiring or recessed side body lighting, provided on the unit. These panels shall reduce the overall usable compartment area in the compartments.

The body roof compartment on the driver side shall be shorted to allow a sufficient step off area from the Zico folding access ladder.

In the lower portion of the compartment, one stokes basket shall be stored with access by a hinged, latching door to the rear of the compartment.

In the upper portion of the compartment, one stokes basket shall be stored with access from the top mounted tread plate doors.

BODY ROOF COMPARTMENTS (OFFICER'S SIDE)

Roof hatch style compartments shall be provided the full length of the body, on the officer's side of the body hose bed area and shall be designed as an integral extension of the lower side compartments with a painted exterior finish. Drain tubes shall be provided at each end of each side compartment which shall extend down through the lower compartments.

Each side roof compartment shall extend the length of the body, which shall be evenly divided into three (3) individually accessed areas, which shall be open through from the front to the rear. The compartment depth shall extend from the ceiling area of the upper side compartments to the top of the body. The interior compartment width of each side roof compartment shall be a minimum of 25-1/2" inside width with a 22" wide access door at the top.

Each roof compartment shall be equipped with an overlapping, hinged lift up tread plate door. These doors shall be constructed of 3/16" aluminum tread plate with a 15 degree break on all sides. Each door shall have two (2) gas shock style stay open devices which shall also retain the door in the closed position. Each compartment door shall be equipped with a compartment light, a door button switch and a floor drain with a plastic tube to direct the water below the body.

Protective panels shall be applied inside the compartments to cover any exposed wiring or recessed side body lighting, provided on the unit. These panels shall reduce the overall usable compartment area in the compartments.

The body roof compartment on the officer's side shall be shorted to allow a sufficient step off area from the Zico folding access ladder.

ROLL-UP DOORS

Roll-up doors shall be provided on all compartments. The roll-up doors shall be constructed from aluminum extruded slats which shall have a flexible seal between each slat for proper sealing of the door.

A synthetic rubber seal shall be provided at each side, top and bottom edge of the door to prevent entry of dirt into the compartment.

The door shall be equipped with a lift bar style latch mechanism which shall latch at the bottom of the door mounting extrusion.

The roll-up door assembly shall be furnished with a spring-loaded, counter balance assembly to assist in door actuation.

All running board and high side compartments shall be equipped with roll-up doors.

ROBINSON ROLL-UP DOORS

The roll-up doors shall be Robinson (ROM) brand roll-up doors, equipped with a brushed aluminum finish, with a PVC inner seal to prevent metal to metal contact and to repel moisture. The slats shall be double-wall extrusion 1.366" high by .315" thick with interlocking end shoes to prevent the slats from moving side-to-side and binding the door . All slats are to have interlocking joints to prevent penetration by sharp objects.

PROTECTION PANEL(S)

Seven (7) protection panel(s) shall be provided at the top of all body exterior compartments fitted with roll-up doors. The panel(s) shall be installed below the roll-up area to prevent possible damage to the roll-up door by misplaced equipment. Each protection panel shall be bolted in place and have a brushed plain aluminum finish.

PULL STRAPS

Pull straps shall be provided for the roll up doors on the right and left side of the apparatus.

SWEEP-OUT COMPARTMENT FLOORS

Compartment floors shall be welded to the compartment walls and have a sweep out design for easy cleaning.

Compartments with hinged doors shall have the door opening flanges bend down to produce the sweep-out design.

Compartments with roll-up style doors shall have the external floor flange stepped down, 1/2" high x 2" deep, to produce a sealing surface for the roll-up doors below the compartment floor. The sweep out design shall also permit easy cleaning.

Compartments set on running boards, which could cause additional corrosion potential, are not acceptable.

Stainless steel scuff plates shall be installed on the floor of each compartment near the edge of the door opening to protect the compartment floor when accessing equipment from the compartment.

A total of eight (8) scuff plates will be provided.

BEAVERTAILS

The rear body beavertail area shall be furnished with a squared off appearance to maximize the available compartment area, while providing added support to the rear step support structure. The beavertail panels shall be assembled in conjunction with the rear body corner panels, utilizing a 2" radius for the full height of the body side compartments. This assembly shall provide a vertical mounting surface for tail lights at the rear most portion of the body and additional storage space.

The inside of the beavertails shall be furnished with polished aluminum tread plate overlays.

COMPARTMENT TOPS

Compartment tops shall be covered with polished aluminum tread plate on both sides.

DRIP MOLDING

Compartment tops over all side compartments shall have a 45 degree flange formed out to provide protection against water runoff. A secondary extruded drip molding shall be provided between low compartments and auxiliary high side compartments, when auxiliary compartments are provided.

COATED FASTENERS - (NO EXCEPTIONS)

All exterior fasteners shall be coated stainless steel screws. Screw threads shall be coated with reusable, self-locking, sealing material to provide vibration resistance. Screw heads shall be coated with a sealing element to prevent galvanic corrosion between dissimilar metals. Non-coated screws shall only be provided as part of vendor supplied component installations.

COMPARTMENT LOUVERS

Ventilation between compartments to atmosphere shall be provided and located to avoid water entry into compartments.

ACCESS PANELS

Removable access panels shall be provided in all lower compartments to access spring pins, fuel tank sender, electrical junction compartment and rear body mounts.

Protective panels shall be located in the rear compartments providing access to the lights and associated wiring. The covers shall also serve as protective covers to prevent inadvertent damage to lights or wiring from tools or equipment located in the compartment.

ZICO FOLDING ROOF ACCESS LADDERS

Two Zico RL-2-6 Quic-Ladders, swing out & down vehicle ladders shall be provided on the left and right rear body corners. The ladders shall store parallel to the body. A spring loaded locking handle shall keep the ladders stored to the body. Releasing the lock shall allow the ladders to pull out to allow for climbing at a comfortable and safe angle. At the top of the ladders there will be an appropriately sized, illuminated step off area and additional grab handle to allow safe movement at the top of the ladders. The ladders shall automatically latch and will not retract until the scissor lock is raised.

The standard configuration has a two-rung fold-down section and a six-rung main ladder section. All rungs are cast aluminum with a flat nonskid surface for traction and safety. Handrails shall be 1 1/4" heavy walled aluminum tubing, covered between rungs by ribbed black neoprene tubing, which provides a firm gripping surface.

REAR BODY PANEL

The rear body panel shall be fabricated from a minimum of 3/16" polished aluminum tread plate and shall extend the full width between the beavertails. This panel shall be full height from the rear step to the hose bed floor. The panel shall be bolted on and removable, with no part of the rear panel attached to the booster tank.

BODY RUB RAILS

Sacrificial aluminum tread plate rub rails shall be mounted at the base of the body, extend outward a minimum 3/4", downward 2" and flange inward 1". The rub rails shall extend the full length of

the main body and wrap around the rear body corners. Rub rails shall be designed to bolt to the body from the bottom side of the compartment area, so as not to damage the body side panels on initial impact and to provide for ease of replacement.

RUNNING BOARD STEPS

The driver and officer running board steps shall be fabricated of 3/16" polished aluminum tread plate. The outside edge on each step shall be fabricated with a double break, return flange. The steps shall be rigidly reinforced with a heavy duty support structure. The running boards shall not form any part of the compartment design, and shall be bolted into place with a minimum 1/2" clearance gap between any panel to facilitate water runoff.

OFFICER SIDE RUNNING BOARD STORAGE WELL

A storage well, constructed of 1/8" aluminum, shall be recessed into the officer’s side running board. The storage well shall measure 9" deep x 9" wide x as long as possible between the running board support members. Drain holes shall be located in the bottom corners to allow water to drain from the storage well.

The officer's side running board hose well shall be furnished with Velcro straps to secure the hose stored in the well. The straps shall be attached to each side of the hose well with stainless steel footman loops.

DRIVER SIDE RUNNING BOARD STORAGE WELL

A storage well, constructed of 1/8" aluminum, shall be recessed into the driver’s side running board. The storage well shall measure 9" deep x 9" wide x as long as possible between the running board support members. Drain holes shall be located in the bottom corners to allow water to drain from the storage well.

The driver's side running board hose well shall be furnished with Velcro straps to secure the hose stored in the well. The straps shall be attached to each side of the hose well with stainless steel footman loops.

REAR STEP

The rear step shall be twelve (12) inches deep, recessed between the rear portion of the rear side compartments. The step shall be fabricated from 3/16" polished aluminum tread plate, and shall be rigidly reinforced. The recessed design of the rear step shall not restrict the usable space of the side compartments with a 52" wide rear step.

The rear edge of the step shall be designed to accommodate the rear clearance lights, recessed for protection in the step reinforcement channel. This step shall be bolted into place with a minimum 1/2" clearance gap between it and the body panel.

INTERMEDIATE REAR STEP

An eight (8) inch deep, bolt on intermediate rear step, fabricated from 3/16" aluminum tread plate, shall be installed. The step shall be approximately 8" deep x 48" wide.

ISOLATED REAR STEP COMPARTMENT

An isolated rear step compartment measuring 40" high x 46" wide x 30" deep with a door opening of 38" high x 43-3/4" wide shall be provided at the rear of the apparatus.

The rear step compartment door shall be a roll-up door. The roll-up door shall be equipped with a brushed aluminum finish.

GRAB RAILS

All hand rails shall be 1-1/4" outer diameter, knurled bright anodized aluminum extrusion, designed to meet NFPA 1901 requirements.

Molded gaskets shall be installed between the handrail stanchion castings and body surfaces to prevent electrolytic reaction between dissimilar metals and to protect paint.

GRAB RAIL LOCATIONS:

Two (2) vertical rails shall be mounted on the rear edge of the beavertails, one (1) each side.

One (1) horizontal, full width handrail shall be installed on the rear, below the level of the hose bed.

Two (2) 18" horizontal handrails shall be provided and installed one (1) on each side at rear top of body.

SAFETY SIGN(S) AT REAR STEP AND CROSS WALKWAY(S)

Safety sign(s) shall be located on the vehicle at the rear step, and at any cross walkway(s), to warn personnel that riding in or on these areas while the vehicle is in motion is prohibited.

REAR WHEEL WELL LINERS

Fully removable, bolt-in, 1/8" aluminum fender liners shall be provided. The wheel well liners shall extend from the outer wheel well body panel, into the truck frame. Removable vertical splash shields, inward of the wheels, shall be provided to give access to the hydraulic components. The completely washable fender liners shall be designed to protect the front and rear compartments and main body supports from road salts, dirt accumulation and corrosion. Fender liners which are welded in place or are only partially removable shall not be considered.

REAR FENDERETTES

The rear fenders shall be equipped with easily replaceable, polished extruded aluminum fenderettes. The fenderettes shall be equipped with a rubber gasket molding between the body panel and the fenderette.

Fenderettes that are integrally welded to the body side panels shall not be acceptable.

AIR BOTTLE STORAGE COMPARTMENTS

A total of five (5) SCBA air bottle storage compartments (8" high x 8" wide x 26" deep) shall be inserted into the body fender area on a 5 degree pitch. The compartments shall be located with two (2) on the driver side and three (3) on the officer side of the rear body fender panels. The lower portion of the compartments shall be non-abrasive to absorb shock and help secure the bottle.

Each storage compartment shall be equipped with a polished stainless steel door.

MUD FLAPS

Heavy duty mud flaps shall be provided behind the rear wheels.

REAR TOW EYES

Two (2) painted tow eyes shall be furnished on the rear of the vehicle. The tow eyes shall be made from plate steel and shall be bolted directly to the chassis frame rails with grade 8 bolts and shall extend below the body. The tow eyes shall be smooth and free from sharp edges, and have a minimum eyelet hole of 2-1/2". The tow eyes shall be painted.

WINCH RECEIVER POINT- REAR OF BODY

A receiver point shall be provided below the rear of the body for a portable winch. The receiver point shall be a 2 1/2" x 2 1/2" x 1/4" seamless steel tube welded and gusseted to 3" x 1 1/2" steel channel directly bolted to four points on the chassis frame rails. A 12V electrical connection with a quick disconnect compatible with the portable winch shall be provided adjacent to the receiver point. A plastic end cap shall be provided for the quick disconnect.

WINCH RECEIVER POINT - EACH SIDE OF THE BODY

A receiver point shall be provided beneath the rub rail toward each side of the Rescue body for a portable winch. The receiver point shall be a 2 1/2" x 2 1/2" x 1/4" full width of body seamless steel tube welded and gusseted to 3" x 1 1/2" steel channel directly bolted to four points on the chassis frame rails. A 12V electrical connection with a quick disconnect compatible with the portable winch shall be provided adjacent to the receiver point. A plastic end cap shall be provided for the quick disconnect.

HOSE BED (48" WIDE)

The hose bed shall be located directly above the booster tank and shall be free from all sharp objects such as bolts, nuts, etc., to avoid damage to fire hose.

For added strength, rigidity and appearance, the hose bed side walls shall have the top edge flanged outward two (2) inches and downward one (1) inch. In a similar fashion, the top edge of the front wall shall be flanged inward two (2) inches and downward one (1) inch.

The hose bed shall provide a minimum 30 cubic feet hose storage area for 2 ½" or larger fire hose to meet NFPA 1901 minimum pumper hose storage requirement.

The apparatus weight analysis shall be based on 800' of 2 ½" hose unless otherwise specified. If the hose load to be carried exceeds this minimum, the purchaser shall advise the manufacturer prior to contract so adequate chassis carrying capacity can be provided.

HOSE BED FLOORING

Flooring to be constructed from extruded aluminum and be properly spaced for ventilation. The flooring shall be smooth and free from sharp edges to avoid hose damage. The hose bed floor shall be removable to provide access to inner body framework.

HOSE BED PARTITION

One (1) fully adjustable 3/16", brushed finish, aluminum hose bed partition shall be provided. Partition shall be easily adjustable by means of Unistrut channels located at the front and rear of the hose bed. Partition shall be removable for access to the booster tank.

CUSTOMER REQUIRED HOSE STORAGE CAPACITY

The apparatus hose bed shall be capable of storing the following customer specified hose loads. In addition, the vehicle weight analysis shall be based off of this hose load provided the specified hose load exceeds NFPA minimum standards.

The hose bed shall be capable of storing;

- 500 feet of 5" LDH
- 250 feet of 2 ½" double jacket hose

HOSE BED COVER, ALUMINUM TREAD PLATE

An aluminum tread plate hose bed cover shall be mounted to the side body flanges utilizing a full length stainless steel hinge on each side. The cover shall be constructed of 3/16" aluminum tread plate with aluminum extrusion frame. The cover shall be supported by a fixed center partition which shall be 1-1/2" higher than the side body flanges to allow water runoff.

Handles shall be provided at the rear for lifting. Gas springs and cables shall be provided at the

front to hold open the doors.

Switches shall be provided on each side cover, which shall be tied into the "Do Not Move Apparatus When Light Is On" warning light in the cab.

A hinged access door shall be provided over the water tank fill tower area to allow access to the fill tower when the hose bed cover is in the closed position. The access door shall be hinged to the front to help prevent the door from opening when the apparatus is in motion.

NYLON WEBBING

Black nylon webbing, approximately 1 ½" in width shall be at the rear of the tread plate hose bed cover. The webbing shall be secured with Velcro tabs to the rear body.

****** COMPARTMENT ACCESSORIES ******

ADJUSTABLE SHELVING

Compartment shelving shall be constructed of 3/16" brush finish aluminum with a 2" upward bend at front and rear, and side supports. Shelving shall be vertically adjustable with spring nuts in aluminum strut channel.

Adjustable shelves shall be located as follows:

- Three (3) in the driver side front compartment

500 POUND FLOOR MOUNTED ROLL OUT TRAYS

Floor mounted roll-out trays shall consist of heavy duty, roller bearing slide tracks with an end load rating of 500 pounds, securely fastened to the compartment floor. The tray shall be fabricated from 3/16" brushed aluminum with a minimum 2" high flange on each of the four sides to assist in retaining the equipment stored on each tray. The slide tracks shall have a 100% extension, allowing the tray to extend out of the compartment completely.

The 500 pound floor mounted roll out trays shall be located as follows:

- One (1) in the rear step compartment

ADJUSTABLE ROLL-OUT TRAY

Roll out adjustable compartment shelving shall be constructed of 3/16" brush finish aluminum with a 2" upward bend at front and rear, and side supports attached to 250# rated slides. Slide out adjustable shelving shall be vertically adjustable with spring nuts in aluminum strut channel. Slide out adjustable shelving shall have gas springs to hold in and out.

The adjustable roll-out trays shall be located as follows:

- One (1) in the officer side front compartment

- One (1) in the driver side rear compartment
- One (1) in the officer side rear compartment
- One (1) in the rear step compartment

ROLL-OUT/ DROP DOWN TRAYS

The roll out/tilt tray shall consist of a 3/16” brushed aluminum finished aluminum tray with a minimum 2” lip on all four sides. Heavy duty aluminum Unistrut "C" channel tracking material shall be utilized to securely fasten the slide tracks to the compartment walls, while allowing height adjustment.

The slide mechanism shall consist of a low-weight high-strength plastic to create a robust front bracket to support the aluminum tray. The rear of the tip down tray shall be mounted on a slider with an integral pivot plate. This slider and pivot plate shall be mounted inside an aluminum rail for maximum strength. The tray shall be secured in the stowed position utilizing a quarter turn latch. The roll out/tilt tray shall be rated for 330# capacity.

Roll out/Tilt trays will be located as follows:

- One (1) in the officer side over the wheel high side compartment

ADJUSTABLE, VERTICAL DIVIDERS

Horizontally adjustable, vertical compartment dividers shall be fabricated from 3/16" brushed aluminum material. The dividers shall extend the full depth of the specified compartment and will be securely mounted to a slide track to allow the divider to be adjusted the full width of the compartment.

Adjustable, vertical dividers shall be located as follows:

- One (1) adjustable divider(s) shall be located in the driver side front compartment.

SWING OUT TOOL BOARD(S)

One (1) swing out tool board(s) shall be provided and mounted in the driver side wheel well compartment. The tool board(s) shall be constructed of 3/16" smooth aluminum allowing mounting of equipment on the interior and exterior of the tool board(s). The tool boards shall be installed with a Performance Advantage Company PM-1000 Swing-Out Module Kit. Aluminum angles shall attach the hinges to Unistrut tracking to allow depth adjustments. A heavy duty thumb latch shall be provided to secure the tool board(s) in the closed position.

VERTICAL PULL OUT TOOL BOARD

One (1) vertical pull out tool board(s) shall be provided and mounted in the driver side front compartment. The tool board(s) shall be constructed of 3/16" smooth aluminum allowing mounting of equipment on both sides of the tool board(s). The tool board shall be attached to #250 rated slides, one at the top and one at the bottom of the tool board. 3/16" aluminum angles shall attach the slides to tracking to allow horizontal adjustments. A gas shock shall be used to secure the tool board in the stored and

deployed position.

HOPPER FOR SPEEDY DRY

A hopper for **(customer supplied)** "Speedy Dry" material shall be provided with a fill tower and access pipe valve. The hopper shall have no less than a 25 gallon capacity. The hopper will be located on top of the body as space permits.

HYDRAULIC REEL

Three (3) Hannay, Model 2016-17-18 electric rewind Hydraulic reel(s) with a capacity of 100 feet of dual hydraulic hose shall be provided.

- Two reels shall be mounted high in the rear step compartment to the left and right of the compartment.
- One reel shall be mounted in the front bumper extension on the driver's side and shall be covered by a full width front bumper cover.

Three (3) Hannay 4-way stainless steel roller assembly(s) shall be provided on the specified hydraulic reel(s). The roller assembly opening shall be the full width of the reel drum. Support brackets for the roller assembly shall be bolted to the hose reel.

HYDRAULIC OIL - HOLMATRO

Four (4) gallon(s) of Holmatro hydraulic oil shall be provided and installed when and where it is needed as specified by the customer.

One hundred feet (100') of high pressure, twin line hydraulic hose for Holmatro tools shall be provided on each of the three hydraulic reels.

HYDRAULIC RESCUE TOOL CONNECTIONS

Valved connectors to connect Holmatro twin hydraulic hoses shall be located in the driver side and officer side front compartments. The ports shall be piped by use of high pressure hydraulic hose line to the rescue tool pump to be located in the rear step compartment.

****** 110/220 VOLT A.C. ELECTRICAL AND GENERATOR SECTION ******

120/240 VOLT ELECTRICAL SYSTEM TESTING

All line voltage wiring and permanently connected devices and equipment shall be subjected to a dielectric voltage withstand test of 900 volts for one minute. The test shall be conducted between live parts and the neutral conductor and between live parts and the vehicle frame with any switches in the circuits closed. The test shall be conducted after all bodywork has been completed. The dielectric tester shall have a minimum 500 VA transformer with a sinusoidal output voltage that can be verified.

Electrical polarity verification shall be made of all permanently wired equipment and receptacles to determine that connections have been properly made.

OPERATIONAL TESTING

The apparatus manufacturer shall perform the following operation test and shall certify that the power source and any devices that are attached to the line voltage electrical system are properly connected and in working order.

The generator shall be started from a cold start condition and the line voltage electrical system shall be loaded to 100 percent of the nameplate voltage rating.

The following items shall be monitored and documented every 15 minutes:

- The cranking time until the generator starts and runs.
- The voltage, frequency, and amperes at continuous full rated load.
- The generator oil pressure, water temperature, transmission temperature, hydraulic temperature, and the battery rate charge, as applicable.
- The ambient temperature and altitude.

The generator shall operate at 100 percent of its nameplate wattage for a minimum of two (2) hours.

HYDRAULIC GENERATOR

Smart Power 30 kW Top Mount Series Hydraulic Generator (Preliminary)

A Smart Power, model HR-30, fully enclosed 30000 watt hydraulic generator shall be provided.

The generator system shall come with a standard 5 year/1,000 hour fully transferable warranty from the manufacturer.

The unit shall come equipped with: generator tray assembly (which includes the generator, generator enclosure, hydraulic motor, detachable oil cooler/fan enclosure assembly, electronics package, 10 micron spin-on fluid filter and detachable reservoir), axial piston hydraulic pump with pressure compensated control, and Command and Control Center (CCC) display with all required wiring harnesses. The CCC shall be an interactive operator control center, equipped with smart touch solid-state buttons, with displays for voltage, frequency, amperage, hour meter, service reminders, operator warnings, system faults and diagnostics. Standard electronics package shall include smart start engagement to reduce mechanical stress, precise voltage and frequency control, cold start system, automatic load and temperature compensation, integrated diagnostics system, and other automated control features to protect system, vehicle and operator.

The generator cover, the generator electrical enclosure, the oil cooler/fan enclosure, the hydraulic fluid reservoir and other steel structural components shall be protected with a white powder coat finish.

An aluminum grate shall be attached over top of the assembly to provide a non-slip walking surface.

The body of the generator tray assembly shall be 40" long x 19.0" wide x 22" high with cooler/fan enclosure and grate mounted on top of the assembly. The approximate weight of the system is 700 pounds. The hydraulic pump shall be driven by a chassis transmission mounted power take off (PTO).

The wiring from the generator to the breaker box shall be type SO with suffix WA flexible cable.

Ratings and Capacity*

- Rating: 32000 watts peak - 30000 watts continuous
- Volts: 120/240 volts
- Phase: Single, 4 wire
- Frequency: 60 Hz
- Amperage: 250 amps @ 120 volts or 125 amps @ 240 volts
- Engine speed at engagement: Standard soft start feature allows for any speed engagement
- Operation range: 1200 to 3000 RPM

Testing
The generator shall be tested in accordance with all current NFPA 1901 standards.

Notes
*All ratings and capacities shall be derived utilizing current NFPA 1901 test parameters.

GENERATOR PTO

A hot shift PTO shall be provided on the transmission for the Smart Power generator. The PTO shall be controlled from the cab. The control shall include a PTO engagement switch and a PTO engaged indicator light.

GENERATOR WARRANTY

The specified generator shall have a five (5) year or one thousand (1000) hour warranty as provided by the generator manufacturer. A copy of the generator warranty shall be provided at time of delivery.

The generator shall be mounted above the pump enclosure on the officer side.

Locating the generator greater than 144" from the main breaker panel may require the installation of an additional power disconnecting means.

LOAD CENTER

The generator output line conductors shall be wired from the generator output connections to a Square D, model #QO112L125G breaker panel. The breaker panel shall be equipped with a properly sized main breaker using two (2) of the twelve (12) spaces which leaves a total of ten (10) available spaces.

The generator output conductors shall be sized to 115% of the main breaker rating and shall be installed as indicated in the wiring section.

Ten (10) appropriately sized, 120 volt, circuit breakers shall be provided.

The breaker panel shall be located on the rear wall of the driver side upper compartment.

WIRING METHODS

Wiring/conduit shall not be attached to any chassis suspension components, water or fuel lines, air or air brake lines, fire pump piping, hydraulic lines, exhaust system components or low voltage wiring.

All wiring shall be installed at a minimum of 12 inches away from any exhaust piping and a minimum of 6 inches from any fuel lines.

All wiring shall be securely clamped within 6 inches of any junction box and at a minimum of every 24 inches of run. All supports shall be of nonmetallic material or corrosion protected metal. All supports shall not cut or abrade conduit or cable and shall be mechanically fastened to the vehicle.

All power supply assembly conductors, including neutral and grounding conductors, shall have an equivalent amperage rating and shall be sized to carry not less than 115% of the main breaker rating.

All Type SO or Type SEO cable not installed in a compartment shall be installed in wire loom. Where Type SO or Type SEO cable penetrates a metal surface, a rubber or plastic grommet or bushing shall be provided.

The installation of all 120/240 wiring shall meet the current NFPA-1901 Standards NO EXCEPTIONS

WIRING IDENTIFICATION

All line voltage conductors located inside the main breaker panel box shall be individually and permanently identified. When pre-wiring for future power wiring installations, the non-terminated ends shall be labeled showing function and wire size.

GROUNDING

The neutral conductor of the power source shall be bonded to the vehicle fame only at the power source.

The grounded current carrying conductor (neutral) shall be insulated from the equipment grounding conductors and from the equipment enclosures and other grounded parts. The neutral conductor shall be colored white or gray.

In addition to the bonding required for the lower voltage return current, each body and driving/crew compartment enclosure shall be bonded to the vehicle frame by a copper conductor. The conductor shall have a minimum amperage rating of 115 percent of the name plate current rating of the

power source specification label.

CIRCUIT BREAKER/RECEPTACLE INSTALLATION

The system shall be installed by highly qualified electrical technicians to assure the required level of safety and protection to the fire apparatus operators. When multiple circuit are required, the circuits shall be wired to the breaker panel in a staggered configuration to minimize electrical loads on each breaker or generator (leg) circuit. The wiring, electrical fixtures and components shall be to the highest industry quality standards available on the domestic market. The equipment shall be the type as designed for mobile type installations subject to vibration, moisture and severe continuous usage.

RECEPTACLE INSTALLATIONS

Any receptacle installed in a wet location must be a minimum of 24 inches above the ground and provided with an approved wet location cover. Wet receptacles may not be mounted at more than 45 degrees from vertical, nor can they be mounted in a face-up position.

ELECTRIC CABLE REEL

Two (2) Akron Brass Model #ERWC-15-10 electric, 120 volt, electric rewind cord reels (able to accommodate 200 feet of 10 gauge or 250 feet of 12 gauge electric cable). The reels shall be provided and wired to the breaker panel. The reels shall be equipped with a universal frame that shall allow the 12 volt motor to be mounted in four different positions. The customer shall have the ability to move the motor from front to back or side to side without having to purchase extra parts. The reel shall be securely mounted and equipped with a rewind control adjacent to the reel.

The cord reels shall be mounted in the rear compartments with one (1) on the driver side and one (1) on the officer side.

The circuit breaker used to protect any device attached to the cord reel shall be sized to the smallest electrical connection used.

ELECTRIC CABLE

Two hundred-fifty (250) feet of Type SO yellow 12/3 heavy duty electric cable shall be provided on each of the reels.

JUNCTION BOX(ES)

Two (2) Akron Model EJB, four (4) outlet junction box(es) with three (3) NEMA 5-15R straight blade receptacles and one NEMA L-15R twist lock receptacle direct wired on the end of the cable shall be provided. The box will be powder painted yellow.

CABLE ROLLER ASSEMBLY

Two (2) four (4) roller assembly(s) shall be provided adjacent to each cord reel to provide un-obstructed deployment and rewinding of the cable.

Two (2) cable ball stop(s) shall be installed on the cable to keep the cable end from passing through the roller assembly.

Two (2) holder(s) constructed from 1/8" aluminum tread plate shall be provided for each cord reel(s) junction box. The location of the holder shall be adjacent to the cord reel roller assembly or as directed by the fire department.

LIGHTING (RECESSED RIGHT SIDE OF BODY)

Two (2) Fire Research FOCUS, model #FC200, shall be recessed, one rearward and one forward on the right side of the body using the FOCUS custom castings. The recess casting shall incorporate internal heat dissipating fins. The bulb shall be accessible through the front glass and frame which is fastened to the lamp assembly by four Phillips head screws. The flush mount housing shall be no more than 2" in depth.

Each Fire Research light shall be equipped with a 500 watt model S50, FOCUS™ lamp head. The small, low-profile lamp head shall be no larger than 3.5" high and shall actively direct 50 percent of the light from a quartz bulb onto the action area while still providing 50% illumination in the working area. The bulb shall be easily accessible through the front glass and frame. Changing the bulb should be easily done from the front of the lamp head. The glass and frame must be removable, held onto the lamp assembly by no more than four front screws.

Two (2) model S50, 500 watt light heads shall require one (1) 120V, 15 amp circuit breaker.

LIGHTING (RECESSED LEFT SIDE OF BODY)

Two (2) Fire Research FOCUS, model #FC200, shall be recessed, one rearward and one forward on the left side of the body using the FOCUS custom castings. The recess casting shall incorporate internal heat dissipating fins. The bulb shall be accessible through the front glass and frame which is fastened to the lamp assembly by four Phillips head screws. The flush mount housing shall be no more than 2" in depth.

Wiring used for the lighting shall be a minimum of 16 gauge three (3) wire cable that is properly supported and protected from damage.

Each Fire Research light shall be equipped with a 500 watt model S50, FOCUS™ lamp head. The small, low-profile lamp head shall be no larger than 3.5" high and shall actively direct 50 percent of the light from a quartz bulb onto the action area while still providing 50% illumination in the working area. The bulb shall be easily accessible through the front glass and frame. Changing the bulb should be easily done from the front of the lamp head. The glass and frame must be removable, held onto the lamp assembly by no more than four front screws.

Two (2) model S50, 500 watt light heads shall require one (1) 120V, 15 amp circuit breaker.

LIGHTING (RECESSED REAR OF BODY)

Two (2) Fire Research FOCUS, model #FC200, shall be recessed, on the rear face of the body, one (1) each side using the FOCUS custom castings. The recess casting shall incorporate internal heat dissipating fins. The bulb shall be accessible through the front glass and frame which is fastened to the lamp assembly by four Phillips head screws. The flush mount housing shall be no more than 2" in depth.

Wiring used for the lighting shall be a minimum of 16 gauge three (3) wire cable that is properly supported and protected from damage.

Each Fire Research light shall be equipped with a 500 watt model S50, FOCUS™ lamp head. The small, low-profile lamp head shall be no larger than 3.5" high and shall actively direct 50 percent of the light from a quartz bulb onto the action area while still providing 50% illumination in the working area. The bulb shall be easily accessible through the front glass and frame. Changing the bulb should be easily done from the front of the lamp head. The glass and frame must be removable, held onto the lamp assembly by no more than four front screws.

Two (2) model S50, 500 watt light heads shall require one (1) 120V, 15 amp circuit breaker.

QUARTZ LIGHTS REAR OF BODY SWITCHING

The quartz lights on the rear of the body shall be wired through the circuit breaker panel and switched from the breaker panel via the circuit breakers.

QUARTZ LIGHTS RIGHT SIDE OF BODY SWITCHING

The quartz lights on the right side of the body shall be wired through the circuit breaker panel and switched from the breaker panel via the circuit breakers.

QUARTZ LIGHTS LEFT SIDE OF BODY SWITCHING

The quartz lights on the left side of the body shall be wired through the circuit breaker panel and switched from the breaker panel via the circuit breakers.

COMMAND LIGHT, KNIGHT-2 MODEL KL465 LIGHT TOWER

The apparatus shall be equipped with an all electric floodlight tower. The unit shall not require tapping into vehicle braking system to be operated, eliminating the chance for vehicle brake problems. Hydraulic or pneumatic type floodlights are not acceptable alternatives to the all electric light tower specified.

The light tower shall extend 87-1/2" above the mounting surface and shall extend to full upright position in less than 15 seconds. The overall size of nested light tower shall be approximately 23" wide x 47" long x 11-1/4" high and weigh approximately 136 pounds.

The Command Light assembly shall be of aluminum construction, with stainless steel shafts and bronze bushings for long life and low maintenance.

The electrically controlled unit shall not require usage of the vehicle's air supply for operation, thereby eliminating the chance for air leaks in the vehicle braking system. Hydraulic or pneumatic type floodlights are not acceptable alternatives to the specified all electric light tower.

The light tower shall be a two-stage articulating device with a lighting bank on top of the second stage capable of continuous 360 degree rotation. The light shall be elevated by electric linear actuators, one (1) actuator shall elevate the light bank and one (1) actuator shall adjust the light bank angle from 0 to 110 degrees. Power for the light bank shall be supplied through power collecting rings thus allowing continuous 360 degree rotation in either direction.

The tower base shall have a light that illuminates the envelope of motion during any movement of the light tower mast.

The light tower shall be capable of overhanging the side or back of the vehicle to provide maximum illumination to the vicinity adjacent to the vehicle.

The light tower shall be controlled with a hand-held 15 foot umbilical line remote control. The storage station for the remote control unit shall be equipped with a button to activate the "Auto-Park" automatic nesting feature.

The controls on the remote box shall be:

- Three (3) switches, one (1) for each light bank.
- One (1) light bank rotation switch.
- One (1) switch for elevating lower and upper stage.
- One (1) indicator light to indicate when light bank is out of roof nest position.
- One (1) indicator light to indicate when light bank is rotated to proper nest position.

The Command Light shall be equipped with the following bank of floodlights:

- Number of lamp heads: Six (6)
- Voltage: 120 volt
- Watts of each lamp head: 650 watts
- Total watts of light tower: 3900 watts

The light heads shall be mounted in three (3) on each side of the light tower, giving two (2) vertical lines of three (3) when the lights are in the upright position.

The six (6) 650-watt light heads shall require one (1) 120-volt, two pole 15-amp circuit breaker.

The light tower shall be mounted on the upper custom cab roof.

LADDER STORAGE

The ground ladders shall be stored horizontally under the hosebed, in the center of the apparatus.

LADDERS

The following Alco-Lite ground ladder compliment shall be provided:

- One (1) Alco-Lite model PEL-24; 24', aluminum, two (2) section extension ladder shall be provided.
- One (1) Alco-Lite model PRL-14; 14', aluminum, straight roof ladder with folding hooks shall be provided.
- One (1) Alco-Lite model FL-10; 10', folding, aluminum, attic ladder shall be provided.

****** PIKE POLES AND HOLDERS ******

PIKE POLE STORAGE

Five (5) pike pole tube(s) shall be provided. The tubes shall be positioned to enable storage of Fire Hooks Unlimited New York Roof Hooks and shall be accessible from the rear of the apparatus. Each pike pole holder shall be labeled to indicate the pike pole length.

The pike pole tube(s) shall be mounted in the ladder storage compartment.

- Three (3) 6' Fire Hooks Unlimited New York Roof Hooks with pry end.
- One (1) 8’ Fire Hooks Unlimited fiberglass pike pole
- One (1) 10’ Fire Hooks Unlimited fiberglass pike pole

SUCTION HOSE STORAGE

The suction hose shall be located under the hose bed, next to the ladder storage on the driver’s side of the apparatus.

SUCTION HOSE

Two (2) 10' sections of six (6) inch Kochek (PVC) suction hose with lightweight hard coat couplings shall be furnished. Couplings shall include a long handle, female swivel on one end and a rocker lug male on the other end. All threads shall be six (6) inch N.S.T.

NOTE: All PVC suction hoses are strictly drafting hoses and must not be used on hydrants or in pressure applications, as serious personal injury or death may occur.

STRAINER

One (1) 6" NST barrel type strainer(s) shall be provided to attach to the suction hose. A compartment mounting bracket shall also be provided to store the strainer(s) when not in use.

HYDRANT ADAPTER

A double female swivel hydrant adapter shall be provided along with a screw base mounting

bracket. One end shall attach to the suction hose and the other end to be 4-1/2" N.S.T. thread.

ADDITIONAL ITEMS SUPPLIED WITH THE VEHICLE

- 1 - Pint of touch up paint for each color
- 1 -Bag of assorted stainless steel nuts and bolts

LOOSE EQUIPMENT

The following items shall be provided and shipped loose with the completed apparatus at the time of delivery:

One (1) Fire Hooks Unlimited 30" Hooligan entry bar(s) to be mounted with a flat head axe on the flat area to the rear of the engine tunnel between the rear facing seats.
One (1) Fire Hooks Unlimited 6 lb. flathead axe(s) with fiberglass handle to be mounted with a 30" hooligan bar on the flat area to the rear of the engine tunnel between the rear facing seats

HAND LIGHT

Six (6) Streamlight model "Vulcan" C4 LED rechargeable hand light(s) and 12 volt charger shall be installed on a flat area at the rear of the dog house between the two rear facing seats. Charger shall be wired to the chassis battery system.

WHEEL CHOCKS

Two (2) ZICO #SAC-44 wheel chocks shall be mounted forward of the rear wheels on the driver side below the side running board compartments.

****** PAINT SECTION ******

PAINT, PREPARATION AND FINISH

The PPG Delta, Low V.O.C., polyurethane finishing system, or equal, shall be utilized. A "Clear Coat" paint finish shall be supplied to provide greater protection to the quality of the exterior paint finish.

All removable items, such as brackets, compartment doors, etc. shall be painted separately to insure finish paint behind mounted items. All compartment unwelded seams exposed to high moisture environments shall be sealed using permanent pliable caulking prior to finish paint.

BODY PRIMER & PREPARATION

All exposed welds shall be ground smooth for final finishing of areas to be painted. The compartments and doors are totally degreased and phosphatized. After final body work is completed,

grinding (36 and 80 grit), and finish sanding shall be used in preparation for priming.

BODY FINISH PAINT

The body shall be finish sanded and prepared for final paint. Upon completion of final preparation, the body shall be painted utilizing the highest quality, state of the art, low V.O.C., polyurethane base paint. Finish paint shall be applied in multiple coats to ensure proper paint coverage with a high gloss finish.

The entire body shall be buffed and detailed.

BODY PAINT

The inside and underside areas of the complete body assembly shall be painted black, prior to the installation of the body on the chassis or torque box.

COMPARTMENT PAINT

The interior of the compartments shall be finish painted job color with a scuff resistant webbing type paint of a contrasting color applied over the painted surfaces.

BODY PAINT

The body paint finish shall be PPG Delta System in a single color, to match customer furnished paint codes and requirements.

PUMP / PIPING PAINT

The pump enclosure and pump/plumbing within the pump enclosure shall be painted black.

CAB PRIMER & PREPARATION

The cab primer shall be a two (2) stage process. First stage shall be a coating with a two part component, self etching, and corrosion resistant primer to chemically bond the surface of the metal for increased adhesion. Second stage shall be multiple coats of a catalyzed, two component, polyurethane primer applied for leveling of small imperfections and top coat sealing.

CAB FINISH PAINT

The entire cab shall be finish sanded and prepared for final paint. Upon completion of final preparation, the cab shall be painted utilizing the highest quality, state of the art, low V.O.C., polyurethane base paint. Finish paint shall be applied in multiple coats to ensure proper paint coverage with a high gloss finish.

The cab exterior shall be painted with PPG Delta system to match purchaser's furnished paint codes. A two-tone paint finish shall be provided with the two-tone break line located approximately 3" below the cab side windows.

The entire exterior finish of the cab shall be buffed and detailed.

CAB INTERIOR PAINT

The interior metal surfaces of the cab shall be finish painted with a textured gray paint.

CHASSIS PAINT

The chassis frame rails, suspension and axles shall be painted black with a Polyurethane base paint prior to installation of any air lines or electric systems to ensure proper serviceability.

WHEEL PAINT

The chassis wheels, (except polished aluminum wheels) shall be painted job color with silver trim around the perimeter.

PAINT CODES

The paint shall match customer furnished paint code(s) and layout. The paint code(s) shall be as indicated below:

- **PRIMARY PAINT COLOR**

  Single Color: Red Paint Code# TBD

- **SECONDARY PAINT COLOR**

  Two/Tone Color: White Paint code# TBD

TOUCH-UP PAINT

One (1) pint of each exterior color paint for touch-up purposes shall be supplied when the apparatus is delivered to the end user.

FINALIZATION & DETAILING

Prior to delivery the vehicle, the interior and exterior be cleaned and detailed. The finalization process detailing shall include installation of NFPA required labels, checking fluid levels, sealing and caulking required areas of the cab and body, rust proofing, paint touch-up, etc.

RUST PROOFING

The entire unit shall be thoroughly rust proofed utilizing rustproof and sound deadening materials applied in manufacturer recommended application procedures. Rust proofing shall be applied during the assembly process and upon completion to insure proper coverage in all critical areas.

****** LETTERING AND STRIPING ******

COMPUTER GENERATED LETTERING

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

FRONT CAB DOOR LETTERING

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

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

REAR CAB DOOR LETTERING

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

Lettering provided on the crew cab doors shall be 3" high.

LETTERING ABOVE WINDSHIELD

Gold leaf, "Sign Gold", with drop shadow lettering shall be provided on the area of the cab above the windshield per the fire department requirements. The design of the lettering above the windshield shall be designed to fit in the 224 sq. inches available.

Lettering provided above the windshield shall be 3" high.

REAR BODY LETTERING

Scotch-Cal without drop shadow lettering shall be provided on the rear body panel per the fire

department requirements. The design of the lettering on the rear of the body shall be designed to fit in the 167 sq. inches available.

Lettering provided on the rear body panel shall be 3" high.

COFFIN COMPARTMENT LETTERING

Gold leaf, "Sign Gold", with drop shadow lettering shall be provided on the coffin compartment per the fire department requirements. The design of the lettering on the coffin compartment shall be designed to fit in the 2500 sq. inches available.

Lettering provided on the coffin compartment shall be 6" high.

LETTERING FONT

The lettering shall be designed and cut with a basic block type font:

"BLOCK TYPE FONT"

****** NFPA REQUIRED SCOTCH-LITE STRIPING ******

SCOTCH-LITE STRIPE

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

The Scotch-Lite shall be white in color.

SCOTCH-LITE ACCENT STRIPE

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

REAR CHEVRON STRIPING

At least 50% of the rear facing vertical surface shall be covered with alternating strips of reflective striping.

The striping shall be 6" Diamond Grade Scotch-Lite.

The Diamond Grade Scotch-Lite shall be Red and Yellow in color.

FRONT BUMPER CHEVRON STRIPING

The striping shall be 4" diamond grade Scotch-Lite.

The Diamond Grade Scotch-Lite shall be red and yellow in color.

******* WARRANTIES & REQUIRED INFORMATION *******

VEHICLE WARRANTY

The proposed vehicle includes a one (1) year new vehicle warranty, upon delivery and acceptance of the vehicle. The warranty will ensure that the vehicle has been manufactured to the proposed contract specifications and will be free from defects in material and workmanship that may appear under normal use and service within the warranty period. The warranty may be subject to different time and mileage limitations for specific components and parts. This warranty is issued to the original purchaser of the vehicle.

The warranty will not apply to tires, batteries, or other parts or components that are warranted directly by their manufacturers. The warranty will not apply to routine maintenance requirements as described in the service and operators manual. No warranty whether express, implied, statutory or otherwise including, but not limited to any warranty of merchantability or fitness for purpose will be imposed.

OVERALL UNIT AND CUSTOM CHASSIS

All components and parts of the vehicle are warranted for a period of one (1) year from acceptance of the vehicle, unless excluded elsewhere in this warranty or described as having longer time limitations.

ENGINE WARRANTY

The unit will be equipped with a Fire Service rated engine, which will come furnished with a five (5) year Engine Manufacturer's warranty. A copy of the manufacturer's warranty will be supplied to define additional details of the warranty provisions.

TRANSMISSION WARRANTY

The required Allison transmission shall be provided with a five (5) year warranty. A copy of the Allison transmission warranty shall be supplied to the purchaser to define additional details of the warranty provisions.

CUSTOM CHASSIS FRAME RAILS

The proposed “Top of the Line” custom chassis frame and cross members will be warranted for an unlimited time period. A copy of the manufacturer’s frame rail warranty will be supplied to define additional details of the warranty provisions.

CROSSMEMBERS WARRANTY

A lifetime warranty will be provided on all chassis frame cross members.

MERITOR AXLE WARRANTY

The Meritor axle/s will be provided with a two (2) year parts and labor warranty. The wheel seals, gaskets and wheel bearings will have a one (1) year warranty. A copy of Meritor's warranty will be supplied to define additional details of the warranty provisions.

CAB STRUCTURE WARRANTY

The proposed cab will be warranted against structural defects for a period of ten (10) years from the date of acceptance of the unit. Details of warranty coverage, limitations and exclusions are included in the specific warranty document.

BODY STRUCTURE WARRANTY

The proposed body will be warranted against structural defects for a period of ten (10) years from the date of acceptance of the unit. Details of warranty coverage, limitations and exclusions are included in the specific warranty document.

CORROSION WARRANTY

The proposed cab and body will be warranted against rust-through or perforation, due to corrosion from within, for a period of ten (10) years. Perforation is defined as a condition in which an actual hole occurs in a sheet metal panel due to rust or corrosion from within. Surface rust or corrosion caused by chips or scratches in the paint is not covered by this warranty.

PAINT FINISH WARRANTY

The proposed paint finish will be warranted for a period of ten (10) years from the date of acceptance of the unit. Details of warranty coverage, limitations and exclusions are included in the specific warranty document.

WATER TANK (LIFETIME)

The proposed water tank will be warranted by the water tank manufacturer for the "Lifetime" of the unit. A copy of the manufacturer's warranty will be supplied to define additional details of the warranty provisions.

HALE FIRE PUMP Limited Standard Warranty

Hale Products, Incorporated ("Hale") hereby warrants to the original buyer that products manufactured by Hale are free of defects in material and workmanship for a period of five (5) years from the date product is first placed into service or five and one-half (5 1/2) years from date of shipment by Hale, whichever period shall be first to expire. Within this warranty period Hale will cover parts and labor for the first two (2) years and parts only for years three (3) through five (5).

NFPA REQUIRED LOOSE EQUIPMENT, PROVIDED BY FIRE DEPARTMENT

The following loose equipment as outlined in NFPA 1901, 2009 edition in accordance with the applicable requirements, will be provided by the fire department. All loose equipment will be installed on the apparatus before placed in emergency service, unless the fire department waives NFPA section 4.21.

Section 5.7 Equipment.

It is the responsibility of the purchaser to ensure that all required equipment has been supplied and installed on the apparatus in order to achieve compliance with the standard prior to placing it in service.

5.7.1 Ground Ladders.

5.7.1.1 All fire department ground ladders carried on the apparatus shall meet the requirements of NFPA 1931, Standard for Manufacturer's Design of Fire Department Ground Ladders, except as permitted by 5.7.1.3 and 5.7.1.4.

5.7.1.2 At a minimum, the following fire department ground ladders shall be carried on the apparatus:

(1) One straight ladder equipped with roof hooks
(2) One extension ladder
(3) One folding ladder

5.7.1.3 Stepladders and other types of multipurpose ladders meeting ANSI AI4.2, Ladders - Portable Metal- Safety Requirements, or ANSI A14.5, Ladders - Portable Reinforced Plastic Safely Requirements, with duty ratings of Type IA or lAA shall be permitted to be substituted for the folding ladder required in 5.7.1.2(3).

5.7.1.4 Stepladders and other types of multipurpose ladders shall be permitted to be carried in addition to the minimum fire department ground ladders specified in 5.7.1.2 provided they meet either ANSI AI4.2 or ANSI A14.5 with duty ratings of Type 1A or 1AA.

Section 5.7.2 Suction Hose or Supply Hose.

It is the responsibility of the purchaser to ensure that all required equipment has been supplied and installed on the apparatus in order to achieve compliance with the standard prior to placing it in service.

5.7.2.1 A minimum of 20 ft (6 m) of suction hose or 15 ft (4.5 m) of supply hose shall be carried.

5.7.2.1.1 Where suction hose is provided, a suction strainer shall be furnished.

5.7.2.1.2 Where suction hose is provided, the friction and entrance loss of the combination suction hose and strainer shall not exceed the losses listed in Table 16.2.4.1 (b) or Table 16.2.4.1(c).

5.7.2.1.3 Where supply hose is provided. It shall have couplings compatible with the local hydrant outlet connection on one end and the pump intake connection on the other end.
5.7.2.2 Suction hose and supply hose shall meet the requirements of NFPA 1961, Standard on Fire Hose.

Section 5.8 Minor Equipment.

It is the responsibility of the purchaser to ensure that all required equipment has been supplied and installed on the apparatus in order to achieve compliance with the standard prior to placing it in service.

5.8.2 Fire Hose and Nozzles. The following fire hose and nozzles shall be carried on the apparatus:
(1) 800 ft (240 m) of 2 1/2 in. (65 mm) or larger fire hose
(2) 400 ft (120 m) of 1 1/2 in. (38 mm), 1 3/4 in. (45 mm), or 2 in. (52 mm) fire hose
(3) One handline nozzle. 200 gpm (750 L/min) minimum
(4) Two handline nozzles. 95 gpm (360 L/min) minimum
(5) One playpipe with shutoff and 1 in. (25 mm), 1 1/8 in. (29 mm), and l 1/4 in. (32 mm) tips

5.8.3 Miscellaneous Equipment. The following additional equipment shall be carried on the apparatus:
(1) One 6 lb (2.7 kg) flathead axe mounted in a bracket fastened to the apparatus
(2) One 6 lb (2.7 kg) pickhead axe mounted in a bracket fastened to the apparatus
(3) One 6 ft (2 m) pike pole or plaster hook mounted in a bracket fastened to the apparatus
(4) One 8 ft (2.4 m) or longer pike pole mounted in a bracket fastened to the apparatus
(5) Two portable hand lights mounted in brackets fastened to the apparatus
(6) One approved dry chemical portable fire extinguisher with a minimum 80-B:C rating mounted in a bracket fastened to the apparatus
(7) One 2 1/2 gal (9.5 L) or larger water extinguisher mounted in a bracket fastened to the apparatus
(8) One self-contained breathing apparatus (SCBA) complying with NFPA 1981, Standard on Open-Circuit Self Contained Breathing Apparatus (SCBA) for Emergency Services, for each assigned sealing position. But not fewer than four, mounted in brackets fastened to the apparatus or stored in containers supplied by the SCBA manufacturer
(9) One spare SCBA cylinder for each SCBA carried, each mounted in a bracket fastened to the apparatus or stored in a specially designed storage space
(10) One first aid kit
(11) Four combination spanner wrenches mounted in brackets fastened to the apparatus
(12) Two hydrant wrenches mounted in brackets fastened to the apparatus
(13) One double female 2 1/2 in. (65 mm) adapter with National Hose (NH) threads, mounted in a bracket fastened to the apparatus
(14) One double male 2 1/2 in. (65 mm) adapter with NH threads, mounted in a bracket fastened to the apparatus
(15) One rubber mallet, suitable for use on suction hose connections, mounted in a bracket fastened to the apparatus
(16) Two salvage covers each a minimum size of 12 ft x 14 ft (3.7 m x 4.3 m)
(17) Two or more wheel chocks. Mounted in readily accessible locations, that together will hold the apparatus. When loaded to its GVWR or GCWR, on a hard surface with a 20 percent grade with the transmission in neutral and the parking brake released
(18) One traffic vest for each seating position, each vest to comply with ANSI/ISEA 207, Standard for High-Visibility Public Safety Vests, and have a five-point breakaway feature that includes two at the shoulders, two at the sides, and one at the front
(19) Five fluorescent. orange traffic cones not less than 28 in. (711 mm) in height, each equipped with a 6 in. (152 mm) retroflective white band no more than 4 in. (102 111m)

from the top of the cone, and an additional 4 in. (102 mm) retroflective white band 2 in. (51 mm) below the 6 in. (152 mm) hand

(20) Five illuminated warning devices such as highway flares, unless the live fluorescent orange traffic cones have illuminating capabilities

(21) One automatic external defibrillator (AED)

5.8.3.1 If the supply hose carried does not use sexless couplings, an additional double female adapter and double male adapter, sized to fit the supply hose carried, shall be carried mounted in brackets fastened to the apparatus.

5.8.3.2 If none of the Pump intakes are valved, a hose appliance that is equipped with one or more gated intakes with female swivel connection(s) compatible with the supply hose used on one side and a swivel connection with pump intake threads on the other side shall be carried. Any intake connection larger than 3 in. (75 mm) shall include a pressure relief device that meets the requirements of 16.6.6.

5.8.3.3 If the pumper is equipped with an aerial device with a permanently mounted ladder, four ladder belts meeting the requirements of NFPA 1983, Standard on Life Safety Rope and Equipment for Emergency Services shall be provided.

5.8.3.4 If the apparatus does not have a 2 1/2 in. intake with NH threads, an adapter from 2 1/2 in. NH female to a pump intake shall be carried, mounted in a bracket fastened to the apparatus if not already mounted directly to the intake.

5.8.3.5 If the supply hose carried has other than 2 1/2 in. NH threads, adapters shall be carried to allow feeding the supply hose from a 2 1/2 in. NH thread male discharge and to allow the hose to connect to a 2 1/2 in. NH female intake, mounted in brackets fastened to the apparatus if not already mounted directly to the discharge or intake.

14.1.8.4 Fire Helmet.

It is the responsibility of the purchaser to ensure that "Fire helmets shall not be worn by persons riding in enclosed driving and crew areas any time the apparatus in placed in service.

14.1.8.4.1 A location for helmet storage shall be provided.

14.1.8.4.2 If helmets are to be stored in the driving or crew compartment, the helmets shall be secured in compliance with 14.1.11.2.

14.1.10 SCBA Mounting.

It is the responsibility of the purchaser to ensure that any SCBA equipment has been supplied and installed on the apparatus in order to achieve compliance with the standard prior to placing it in service.

14.1.10.1 Where SCBA units are mounted within a driving or crew compartment, a positive latching mechanical means of holding the SCBA device in its stowed position shall he provided such that the SCBA unit cannot be retained in the mount unless the positive latch is engaged.

14.1.10.2 The bracket holding device and its mounting shall retain the SCBA unit when subjected to a 9 G force and shall be installed in accordance with the bracket manufacturer's requirements.

14.1.10.3 If the SCBA unit is mounted in a seatback, the release mechanism shall be accessible to the user while seated.

14.1.11 Equipment Mounting.

It is the responsibility of the purchaser to ensure that any equipment installed on the apparatus by them or their subcontractor meets the following requirements prior to placing it in service.

14.1.11.1 All equipment required to be used during an emergency response shall be securely fastened.

14.1.11.2 All equipment not required to be used during an emergency response, with the exception of SCBA units, shall not be mounted in a driving or crew area unless it is contained in a fully enclosed and latched compartment capable of containing the contents when a 9 G force is applied in the longitudinal axis of the vehicle or a 9G force is applied in any other direction, or the equipment is mounted in a bracket(s) that can contain the equipment when the equipment is subjected to those same forces.

Section 15.9.3 Reflective Striping.

It is the responsibility of the purchaser to ensure that Reflective Striping has been supplied and installed on the apparatus in order to achieve compliance with the standard prior to placing it in service.

15.9.3.1'" A retroreflective stripe(s) shall be affixed to at least 50 percent of the cab and body length on each side, excluding the pump panel areas, and at least 25 percent of the width of the front of the apparatus.

15.9.3.1.1 The stripe or combination of stripes shall be a minimum of 4 in. (100 mm) in total width.

15.9.3.1.2 The 4 in. (100 mm) wide stripe or combination of stripes shall be permitted to be interrupted by objects (i.e., receptacles, cracks between slats in roll up doors) provided the full stripe is seen as conspicuous when approaching the apparatus.

15.10 Hose Storage.

It is the responsibility of the purchaser to ensure that any hose storage area includes a positive means to prevent unintentional deployment in order to achieve compliance with the standard prior to placing it in service.

15.10.7 Any hose storage area shall be equipped with a positive means to prevent unintentional deployment of the hose from the top, sides, front, and rear of the hose storage area while the apparatus is underway in normal operations.

EQUIPMENT MOUNTING ALLOWANCE

An equipment mounting allowance in an amount of $30,000 has been included in this proposal. The allowance will provide either purchased or custom manufactured mounting hardware, to provide mounting of Fire Department or proposed equipment on the completed unit.

All of the equipment mounting requirements will be detailed to the manufacturer at or near the time of the final inspection. Any required modifications to existing components or accessories will be charged to this allowance. The manufacturer will maintain a detailed summary of all labor and materials applied to meet the Fire Department requirements and upon completion, will either provide a credit to the Department for labor and materials not consumed by this project or a secondary invoice will be submitted to the Fire Department for all expenditures, which are over and above the original allowance.

DEALER PROVIDED EQUIPMENT TO BE SUPPLIED

The following equipment shall be purchased by the OEM and supplied upon delivery of the apparatus:

- One (1) Bullard T4Max Thermal Imaging Camera, with spare battery and vehicle charger.

- Six (6) Scott Air Pack 75 SCBA with Pak-Alert SE 7 integrated PASS device, with extended duration air line. Units will be capable of using 45 minute carbon fiber cylinders. (not to be included with units)
- Five Hundred Feet (500') of 1 ¾" Mercedes Aquaflow Plus, in 50' lengths, color to be determined at time of order.
- Four Hundred Fifty Feet (450') of 2 ½" Mercedes MTFS 800 hose, in 50' lengths, color to be determined at time of order.
- One (1) Holmatro PPU-15 power unit.
- 650 Feet of Snap Tite HFX 5" LDH hose.
- One (1) Holmatro 4150 Combination Tool with twin line supply hose.

EQUIPMENT TO BE BID AS OPTIONAL

The following equipment shall be bid as optional equipment;

- One (1) Holmatro 4350 Telescopic Ram, twin line: _____
- One (1) Holmatro 4230 Spreader Tool, twin line: _____
- One (1) Warn, model 9.5T portable winch, with wireless remote: _____
- One (1) Ramsey QM 9000 portable winch: _____
- Two (2) Paratech Stabilizer Kits #22-797000: _____ each
- Three (3) TFT HMD-VPGI 1 ½" Fog Nozzles: _____ each
- Two (2) TFT H-2VPGI 2 ½" Fog Nozzles: _____ each
- Fifteen (15) Scott 4.5psi 45 minute carbon fiber cylinders: _____ each
- One (1) Panasonic Toughbook 31, with vehicle charger, GPS and Windows 7 Professional: _____
- Replace the side mount pump panel with a top/side mounted _____

Crosslays shall become speedlays with slide-out trays

PAYMENT OPTIONS

Bidder shall provide the total cost of any savings associated with the prepayment of the chassis or any other portion of the apparatus being constructed upon completion of that portion of the apparatus.

Greenfield Fire District
Maple Ave Fire Company
Engine Rescue

FIVE YEAR SERVICE CONTRACT

Bidder shall provide total cost for a full five year maintenance package including, annual general preventive maintenance service, pump service, annual chassis/engine/transmission service to include filters and fluids, and annual preventive maintenance service for the hydraulic generator to include expendables and required fluids. Any additional repairs or associated parts will be billed at prevailing rates at the time of service. Bidders are to include a complete list of service items which will be included in the maintenance agreement through year five of the agreement.