Fire Apparatus and Custom Fabricators

SPECIFICATIONS

ON A

QUICK ATTACK MINI-PUMPER

FOR THE

REEDY VOLUNTEER FIRE DEPARTMENT

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INFORMATION FOR CONTRACTORS

Sealed bids are requested from reputable companies who construct fire apparatus vehicles. The contractor must have a facility that will house the apparatus in an enclosed building during the construction of the unit. All bids shall include all necessary labor, equipment and material for the fire apparatus and other equipment as outlined in the following specifications.

Bids will be addressed in accordance with the instructions provided above. The type of bid, the date and the bid opening time shall be stated on the front of the bid envelope.

It is the intent of these specifications to describe a Mini-Pumper in sufficient detail to enable to secure bids on comparable equipment. The equipment shall be new, unused, the manufacturers latest production and that which is furnished to fire department in general.

Only manufacturers, owned, operated including all holding and subsidiaries located within the continental United States with an accomplished background in Fire Apparatus building shall be considered. Satisfactory evidence of their ability to construct Fire Apparatus, and the apparatus specified shall be stated. The location of the factory where the apparatus is manufactured shall be identified. The manufacturer shall also state the number of years they have been building fire apparatus and similar vehicles. The factory location must be located within the continental United States. No Exceptions!

Contractors must construct the entire unit, less the chassis, but including the body within their own premises. The contractor must own the rights to the respective extrusions used in the construction of the body. Bodies manufactured by other body companies will not be acceptable and be cause for rejection of bid.

This is an engineer, design, construct and deliver type specification and is not the intention of this agency to write out vendors or manufacturers of similar or equal equipment of the types specified. It should be noted however, that this specification is written around specific needs of this department. With this intent to standardize certain components, therefore in numerous places we have named specific brands of components. This has been done to establish a certain standard of quality. Other brands will be accepted providing the vendor note in the bid that the particular brand meets or exceeds the quality of the actual brand that the specifications call for.

Submit only one (1) bid that meets or exceeds the minimum specifications herewith. No substitutes, stock units, or alternates will be permissible unless such units are requested later in the specifications. If this is done, then the bidder will be automatically disqualified.

This apparatus shall conform to the National Fire Protection Association (NFPA.) Pamphlet No.1901, 2009 edition.

The emergency vehicle, chassis, pump, module body, equipment, devices, and electronic equipment to be delivered under this contract shall be standard specification. The unit shall comply with all Federal Motor Vehicle Safety Standards (FMVSS), and Federal regulation applicable or specified for the year of manufacture. The chassis, components and optional items shall be represented in the manufacturers current technical data. Materials used in the construction shall be new and not less

than the quality conforming to current engineering and manufacturing practices. Materials shall be free from defects and suitable for the services intended.

All bids must be signed. Failure to do so shall cause the bid to be "No-Responsive" and rejected.

The Fire Department reserves the right to reject any or all bids, and also the right to reject the bid or bidder who, in judgment of the buying authority is not in a position to perform the duties within the contract. The competency and responsibility of the bidder will be considered in making the award. These specifications, together with any other documents required herein, shall be included in the final contract. Each bidder shall also submit a copy of his proposed contract form.

It shall be the responsibility of the bidder to assure that their proposal arrives at the proper location by time and date indicated. Late proposals, telegrams, facsimile, or telephone bids will not be considered. Bids will not be considered from firms, individuals and or same owners of separate companies submitting more than one bid. If a vendor represents more than one fire apparatus manufacturer, they will only bid the top of the line apparatus that meets purchaser’s specifications.

Only prices that have been type written in numerals will be accepted by purchaser. Failure to submit a bid with type written numerals will be cause to reject the bid, deemed as irregular and disqualified from consideration.

THE PURCHASER WILL NOT ACCEPT ANY BIDS FROM WHICH DO NOT MEET THESE SPECIFICATIONS, AND WILL HAVE SOLE DISCRETION TO DEEM WHICH BID IS IN THE BEST INTEREST OF THE PURCHASER.

The fire apparatus and equipment to be furnished in meeting these specifications must be the product of an established and reputable fire apparatus manufacturer of twenty (20) years or more. A list of no less than five (5) delivered units (completed apparatus) which have been built by their company. This list shall include not only the companies latest produced units, but also some of its earliest units, to determine the manufacturers reliability, credibility, and its response to service (post delivery).

The general construction of the apparatus shall give due consideration to the nature and distribution of the load to be sustained and the general character of the service to which the apparatus is to be subjected when placed in service. The general design and construction shall be of the latest modern type, remaining fully modular for the ability of body transfer to another chassis, without cutting or welding.

Each bidder must submit a detailed proposal, which accurately specifies the construction method to be used in the apparatus. The purchaser will utilize this proposal to compare the unit proposed with their specifications. To facilitate comparison, all bid proposal specifications shall be submitted in the same sequence as the advertised specification. Any Bidder who fails to submit a set of construction specifications, or photocopies and submits another's specifications as there own construction details will not be considered.

These specifications are based on design and performance criteria, which have been developed by the fire department as a result of extensive research and careful analysis. Subsequently these specifications reflect the only type of fire apparatus that is acceptable at this time. Therefore major exceptions to the specifications will not be accepted.

Deviations from specifications, no matter how slight, shall be clearly explained on a separate cover sheet entitled "EXCEPTIONS TO SPECIFICATIONS". Exceptions and variations (any and all) to these specifications must be set forth on separate sheets, indicating or referencing the page number(s) to the purchasers specifications. These exceptions must be submitted with bid. Bids deemed as taking total exception to these published specifications shall result in immediate rejection of the bid.

Proposals that are found to have deviations from the specifications without listing them on an "EXCEPTIONS TO THE SPECIFICATIONS" sheet, will be rejected. NO EXCEPTIONS!

No prototype apparatus will be considered, and all design, operational, and material features must fully comply with the State, and Federal Motor Vehicle Safety Standards.

Each bid shall be in strict compliance with the purchaser's specifications and shall be accompanied by a detailed description of the work to be performed. Minor details of construction regarding design and material, where not otherwise specified, are to be left to the discretion of the bidder, and will be their sole responsibility. Bidder shall acknowledge receipt of all addenda with bid. The detailed specification section of the specifications shall be adhered to completely. Then it is to be certified by an officer of the manufacturing company and not a sales representative. NO EXCEPTIONS!

Organizations or individuals submitting bids must represent directly the company that will be providing the labor and materials for the construction.

All work performed by the contractor shall be guaranteed by the successful bidder to be fabricated and assembled in a first class workman like manor, and of good quality material.

Bid prices should not include tax. We shall certify tax exemption required.

The apparatus, plating, paint and all items furnished on the apparatus shall be guaranteed by the contractor for a period of one year from acceptance. It shall warrant against defective workmanship and materials at no cost to us. This covers all equipment except maintenance items such as tires, lamps, and filters.

Payment terms must be included with the proposal.

A contract will not be awarded until we have satisfied ourselves that the successful bidder is familiar with this class of equipment, meets the previously described criteria, has the necessary capital, facilities and tools to manufacture the same.

Information, which is incomplete, evasive or of general nature shall be considered as grounds for rejection of the bid.

In making the award of this contract, we shall consider both the prices offered and the qualifications of the bidder, all as indicated within the proposal.

We reserve the right to waive minor informalities and reject any or all bids and/or to accept that proposal which in our opinion is deemed most advantageous from a stand point of design, service and other special features and are not necessarily bound to accept the low bid.

Welding shall not be employed in the assembly of the apparatus in a manner that will prevent the removal of major component parts for service and/or repair. This includes, but is not limited to, individual body compartments, doors, pan braces, body subframe, body sides beavertails, etc.

To insure full dealer support for the service after the sale, the selling dealer must be capable of providing factory service when required.

The successful bidder shall maintain an established service center and parts depot capable of satisfying the warranty service requirements and parts requirements of the vehicle being purchased. The successful bidder must have 24-hour in-house service capabilities to keep down time to a minimum.

The bidder must state location of its authorized service center. This service center must have a staff of factory trained mechanics, well versed in all aspects of service for all major components of the apparatus. The service center must be within a reasonable distance of purchaser. The successful bidder will assume all costs of any services not within reasonable distance as determined by the fire chief. The successful bidder must also maintain a separate facility at the manufacturing site, in order to satisfy the need for possible major emergency service or repair / collision work.

All bidders responding to these specifications shall submit the proper Certificate of Insurance. The Certificate shall certify that the Manufacture of the vehicle bid has, in force, Product Liability Insurance of a minimum of five million dollars ($5,000,000.).

The bidder, if the bidders proposal is accepted by the purchasing party, they shall defend against any and all suits, assume all liability for the use of any patented process, advice, or article forming a part of any apparatus of any appliance furnished under contract.

The successful bidder will be responsible for conducting all road tests as specified by the NFPA. The successful bidder shall also conduct a pump test on the completed unit and supply proper documentation upon delivery of unit. Copies of all testing records shall be forwarded to the fire department prior to the acceptance of the apparatus. The apparatus must pass all tests in order to be considered acceptable.

Upon acceptance, a factory-trained instructor shall instruct the fire department personnel on the operation and maintenance of the unit.

Two copies of a complete operation and maintenance manual, covering the completed apparatus as delivered, including, but not limited to the chassis, pump, wiring diagrams, lubrication charts, and fire fighting equipment.

LIMITED WARRANTY
The body manufacturer shall warrant the new apparatus for a period of twelve (12) months or 12,000 miles (whichever occurs first) from the date of delivery to the original retail purchaser. The warranty will ensure that the vehicle will be free from defects in material and workmanship that may appear under normal use and service within the warranty period.

A copy of the warranty shall be supplied with the bid.

PAINT WARRANTY
The body manufacturer shall warrant the new apparatus paint finish for a period of one (1) years or 12,000 miles (whichever occurs first) from the date of delivery to the original retail purchaser. The warranty will ensure that the vehicle will be free from peeling, cracking, loss of gloss caused by cracking, and any paint failure caused by defective finishes as determined by the manufacturer under normal use and service within the warranty period.

A copy of the warranty shall be supplied with the bid.

ELECTRICAL WARRANTY
The body manufacturer shall warrant the new apparatus electrical system for a period of ten (10) years or 100,000 miles (whichever occurs first) from the date of delivery to the original retail purchaser. The warranty will ensure that the vehicle will be free from defects in the electrical harness and connections under normal use and service within the warranty period.

A copy of the warranty shall be supplied with the bid.

BODY STRUCTURAL WARRANTY
The body manufacturer shall warrant the new apparatus for structural integrity for a period of ten (10) years from the date of delivery to the original retail purchaser. The warranty will ensure that the vehicle will be free all structural defects of both material and workmanship that may appear under normal use and service within the warranty period.

A copy of the warranty shall be supplied with the bid.

CHASSIS

2013 FORD F-550 CHASSIS
4X4 SD SUPER CAB 186" WB DRW XL (W5H)

POWERTRAIN

Powerstroke 6.7L V-8 OHV direct diesel injection 32 valve intercooled turbo diesel engine * 357 amp dual alternator * 750 amp (total) 78 amp hours (Ah) (total) battery dual batteries with run down protection * Engine block heater * 6-speed electronic SelectShift automatic transmission with overdrive, lock-up, driver selection * Part-time four-wheel drive with electronic transfer case shift, auto locking hubs * Driveline traction control * 4.10 axle ratio * Stainless steel exhaust

STEERING AND SUSPENSION

Hydraulic power-assist re-circulating ball steering * 4-wheel disc brakes with front and rear vented discs * Firm ride suspension * Mono-beam non-independent front suspension * Front anti-roll bar * Front coil springs * HD front shocks * Rigid rear axle * Rear leaf suspension * Rear anti-roll bar * HD rear leaf springs * HD rear shocks * Front and rear 19.5" x 6.00" argent steel wheels * LT225/70SR19.5 BSW AS front and rear tires

SAFETY

4-wheel anti-lock braking system * Dual airbags, seat mounted driver and passenger side-impact airbags, curtain 1st and 2nd row overhead airbags * Front height adjustable seatbelts * SecuriLock immobilizer, panic alarm, security system

COMFORT AND CONVENIENCE

Air conditioning, underseat ducts * AM/FM stereo, clock, seek-scan, 2 speakers, fixed antenna * Power door locks with 2 stage unlock, keyfob (all doors) keyless entry * 2 12V DC power outlets, retained accessory power * Analog instrumentation display includes tachometer, oil pressure gauge, engine temperature gauge, turbo/supercharger boost gauge, transmission fluid temp gauge, engine hour meter, exterior temp, systems monitor, trip odometer * Warning indicators include oil pressure, engine temperature, battery, lights on, key, low fuel, door ajar, service interval, brake fluid * Steering wheel with tilt and telescopic adjustment * Power front and rear windows with light tint, driver 1-touch down * Variable intermittent front windshield wipers * Passenger side vanity mirror * Day-night rearview mirror * Interior lights include dome light with fade, front and rear reading lights, illuminated entry * Full overhead console with storage, glove box, front cupholder, instrument panel bin, driver and passenger door bins, rear door bins * Upfitter switches

SEATING AND INTERIOR

Seating capacity of 6 * 40-20-40 split-bench front seat with adjustable head restraints, center armrest with storage * 4-way adjustable driver seat includes lumbar support * 4-way adjustable passenger seat * 60-40 folding rear split-bench seat with FlexFold flip forward cushion/seatback, 3 adjustable rear head restraints * Vinyl faced front seats with vinyl back material * Vinyl faced rear seats with carpet back material * Full cloth headliner, full vinyl/rubber floor covering, plastic/rubber gear shift knob, chrome interior accents

EXTERIOR FEATURES

Side impact beams, front license plate bracket, fully galvanized steel body material * Black fender flares * Black window moldings, black front windshield molding * Black door handles * Black grille * 4 doors * Trailer harness * Driver and passenger power remote black heated convex spotter folding manual extendable trailer outside mirrors with turn signal indicators * Front black bumper with front tow hooks * Aero-composite halogen headlamps * Additional exterior lights include cab clearance

lights, underhood light, remote activated perimeter/approach lights * Clearcoat monotone paint * Ambulance

DIMENSIONS AND CAPACITIES

Output ..... 300 hp @ 2,800 rpm
Torque ..... 660 lb.-ft. @ 1,600 rpm
1st gear ratio 3.974
2nd gear ratio 2.318
3rd gear ratio 1.516
4th gear ratio 1.149
5th gear ratio 0.858
6th gear ratio 0.674
Reverse gear ratio 3.128
Curb weight ..... 8,419 lbs.
GVWR ..... 18,000 lbs.
Front GAWR ..... 7,000 lbs.
Rear GAWR Weight ..... 13,660 lbs.
Payload ..... 9,676 lbs.
Front curb weight ..... 5,078 lbs.
Rear curb weight ..... 3,349 lbs.
Front axle capacity ..... 7,000 lbs.
Rear axle capacity ..... 13,660 lbs.
Front spring rating ..... 7,000 lbs.
Rear spring rating ..... 13,660 lbs.
Front tire/wheel capacity ..... 7,500 lbs.
Rear tire/wheel capacity ..... 15,000 lbs.
Towing capacity ..... 16,000 lbs.
5th-wheel towing capacity ..... 16,500 lbs.
Front legroom ..... 41.1 "
Rear legroom ..... 31.6 "
Front headroom ..... 40.7 "
Rear headroom ..... 38.1 "
Front hiproom ..... 67.6 "
Rear hiproom ..... 67.3 "
Front shoulder room ..... 68.0 "
Rear shoulder room ..... 68.1 "
Passenger area volume ..... 113.3 cu.ft.
Length ..... 271.5 "
Body width ..... 95.2 "
Body height ..... 80.5 "
Wheelbase ..... 186.0 "
Cab to axle ..... 84.0 "
Axle to end of frame ..... 47.6 "
Front tread ..... 74.8 "
Rear tread ..... 74.0 "
Turning radius ..... 25.8 '
Fuel tank ..... 40.0 gal.

***SELECTED OPTIONS* 2013 FORD F-550 CHASSIS**

4X4 SD SUPER CAB 186" WB DRW XL (W5H)

VEHICLE SNAPSHOT

Engine: 6.7L OHV Power Stroke Diesel V8 B20
Transmission: TorqShift 6-Speed Auto w/OD
Rear Axle Ratio: 4.10
GVWR: 18,000 lbs Payload Package

W5H **Base Vehicle Price (W5H)**

PACKAGES
47A Ambulance Prep package

41H ENGINE BLOCK HEATER *STD in AK, CO, IA, ID, ME, MI, MN, MT, ND, NH, NY, SD, VT, WI, WY*

62R TRANSMISSION PWR TAKE-OFF PROVISION

67A DUAL 160-AMP ALTERNATORS (REQ: 99T Engine)

68M PAYLOAD UPGRADE PKG -inc: upgraded frame, upgraded rear axle, upgraded springs, low deflection/high capacity, increased GVWR to 19,5000 (REQ: X8L Axle)

531 TRAILER TOW PKG -inc: trailer brake wiring kit (N/A w/52B Tow Command Integrated Trailer Brake Controller) *Trailer brake controller not included*

585 AM/FM STEREO W/CD/MP3 PLAYER -inc: aux input jack, digital clock, (4) speakers *Requires valid FIN code*

525 CRUISE CONTROL *Requires valid FIN code*

EMISSIONS
25 50 STATE EMISSIONS

ENGINE
99T 6.7L OHV 32-VALVE V8 POWER STROKE DIESEL ENGINE -inc: 200-amp extra HD alternator, dual 78 amp/hr 750 CCA batteries, Intelligent Oil Life Minder, diesel exhaust fuel tank, split-shaft calibration compatibility

TRANSMISSION
44W TORQSHIFT 6-SPEED SELECTSHIFT AUTOMATIC TRANSMISSION W/OD -inc: tow/haul mode (REQ: 99T Engine)

AXLE
X8L 4.88 AXLE RATIO W/LIMITED SLIP DIFFERENTIAL (w/99T Engine REQ: 68M Payload Pkg)
660A XL SERIES ORDER CODE

TIRES
TGB 225/70R19.5G BSW TIRES -inc: (2) front max traction & (4) rear max traction tires *Not recommended for on-road use. Optional spare is traction tire*

INTERIOR COLORS FOR : PRIMARY W/XL
AS Steel OPT

PRIMARY COLORS FOR : PRIMARY W/XL
F1 RED

BUMPER / BRUSH GUARD
The factory Ford bumper shall be removed and replaced with a heavy duty aftermarket front bumper grille guard assembly. Bumper shall be constructed from heavy duty plate steel and steel pipe. The bumper shall be finished with a gloss black powder coat

Bumper shall include towing attachment points incorporated in it. The attachment points shall be unobstructed and easily accessed.

The center of the bumper assembly shall have winch mounting plate capable of supporting up to a 16,500 lb winch assembly. Winch plate shall be constructed of plate steel and painted with a black gloss powder coat finish.

WINCH
A Warn brand winch Model M12000 12V, 12,000# Electric shall be installed in the front bumper extension. The winch shall be supplied complete with 125 feet of 3/8" galvanized aircraft wire cable and replaceable clevis hook. The winch shall be so equipped to enable power reverse and free-spooling. A 12 foot remote control switch shall also be supplied.

TRAILER HITCH
A 2" receiver tube shall be installed at the rear of the chassis to allow the unit the ability to tow. The hitch shall be braced and reinforced to chassis frame, and have a minimum of a Class III rating. There shall be additional bracing required for the securing of the safety chains.

A label shall be provided adjacent to the hitch assembly displaying the rating of the hitch.

A universal 7 way trailer towing electrical connector shall be provided at the rear of the unit near the receiver tube for easy access. Connector shall have a weatherproof cover.

EXHAUST SYSTEM
The exhaust pipe shall exit on the right side of the unit behind the rear wheels.

TIRE PRESSURE MONITORING SYSTEM
A tire pressure monitoring system shall be provided on the chassis. It shall monitor the tire pressure and provide a visual notification of low air pressure.

CHASSIS STEPS
The original steps into the truck shall be removed; new continuous running aluminum tread brite steps (minimum .125" thickness) shall be constructed and installed on both sides using stainless steel bolts.

The step shall be a single step design and of a comfortable height for entering or leaving the cab. The step shall be so arranged so that a fireperson wearing heavy boots and turnout gear can easily gain access to all cab doors.

The steps shall provide anti-slip protection.

REAR TOW EYES
Under the rear tail board there shall be structural steel reinforcement attached to frame rails of chassis to support tow eye assemblies. Mounted at rear center of apparatus it must be capable to with stand the requirements of towing (not lifting) the apparatus without damage.

NFPA 1901 COMPLIANT SEATING
The chassis specified to date, does not offer nor provide provisions for an NFPA compliant seating. The manufacturer does meet all local and Federal motor vehicle standards in regards to safety and seating requirements.

VEHICLE DATA RECORDER
The chassis specified to date, does not offer nor provide provisions for an NFPA compliant VDR system.

SEAT BELT WARNING
The chassis specified to date, does not offer nor provide provisions for an NFPA compliant seat belt warning system. It does meet all local and Federal motor vehicle standards in regards to safety and seating restraints.

PAINTED WHEELS
The chassis outside wheels shall be painted to match body of apparatus. The wheels shall be removed from chassis to be repainted.

FLUID IDENTIFICATION PLATE
A permanently engraved plate shall be installed in the cab specifying the quantity and type of fluids used in the apparatus.

FUEL TYPE PLATE
A permanently engraved plate shall be installed on or near the fuel fill to designate the chassis fuel type.

SEATING LABEL
There shall be a label located in the cab or in view of the driver, stating maximum seating capacity.

VEHICLE HEIGHT LABEL
There shall be a label located in the cab or in view of the driver, stating the overall height of the vehicle.

SEAT BELT WARNING LABEL
There shall be a label located at all seating areas, warning personnel that death or serious injury could result from not wearing seat belts while the vehicle is in motion.

RIDING ON STEP WARNING LABEL
There shall be a label located at all exterior stepping surfaces, stating "Warning: Death or serious injury may result from riding on any stepping surface when the vehicle is in motion.

HELMET WARNING LABEL
A label shall be provided in the cab made visible to everyone in the cab “warning” that “Helmets are not to be warn in cab and safely secured”.

REAR MUD FLAPS
There shall be a set of rear anti-spray black mud flaps shall be installed in the rear wheel well.

BODY CONSTRUCTION

Construction material shall be aluminum, fully welded, with no rivets. The roof and wall beams shall be MIG welded to body exterior panels. All dissimilar metals shall have a barrier material between them to prevent electrolysis.

The entire body is to modular in design, it shall be fully capable of being removed and remounted on another chassis.

The overall body width shall be approximately 96" and an approximate overall body-only height of 80"

The apparatus body shall be constructed of aluminum extrusion and formed aluminum sheet. All exterior panels shall be 5052-H34 corrosion resistant aluminum.

All welds whether seen or not shall be of good craftsmanship, pleasing appearance. Welds, which are visible, shall be either ground smooth, cleaned or power wire brushed. We are stating that we want fire truck quality workmanship not a standard commercial utility body workmanship.

All aluminum body parts are to be welded for unitized construction to give maximum strength throughout the body. The use of any type of adhesive or tape as a structural fastening system is strictly not acceptable.

On all items that are bolted or fastened onto a painted surface there will be isolation strips installed between mating surfaces. This is to prevent problems associated with dissimilar metals and cutting the painted surface by sharp edge of installed items.

The subframe shall consist of aluminum extrusions electrically welded both sides at each joint with aluminum welding wire.

The main body support crossmembers shall consist of 4" aluminum formed channels .The front compartment crossmember shall consist of 4" aluminum formed channels. These crossmembers shall extend the width of the body to support the compartment framing.

Tank support crossmembers shall consist of aluminum channel formed materials. These crossmembers shall extend the width of the tank and be installed on 15" centers. Cross-members shall be welded to a 1/2" X 3" solid aluminum, frame rail mount.

The frame rail mounts shall be isolated from the steel chassis frame rails with a 1/8" X 3" poly strip. Tank crossmembers shall butt into full-length longitudinal tank support rails consisting of 4" aluminum extrusion.

The apparatus body and subframe structure shall be securely fastened to the chassis frame rails with a minimum of six (6) 5/8" O.D. steel "U" bolts. In addition, a minimum of two (2) adequately gusseted and reinforced shear plated with a minimum of two (2) 1/2" grade 8 shear bolts in each plate shall be installed on the forward portion of the body subframe.

Compartment sidewalls shall be securely welded and gusseted to subframe crossmembers.

The body sides shall be .190" aluminum sheet walls that will be welded to the body structure. The header walls and partitions forming and dividing the compartments, plus the compartment floors shall be of .160” aluminum of 5052-H34-alloy construction. The use of thinner or lesser material and any type of adhesive or tape as a structural fastening system is strictly not acceptable.

Compartment floors shall be properly supported, and capable sustaining up to a five hundred (500) pound load.

The roof rails shall be a continuous formed sheet to square up the top of the body to enhance looks and provide a flat mounting surface for lights. Radius type roof rails will not be acceptable.

The roof sheet shall be of .125" aluminum tread-bright secured around perimeter; 3004-H14 alloy. The center section of the roof over the rear storage compartment shall be secured and sealed from the hose bed. Roof shall be sealed and weather tight.

All compartments shall be of sweep-out type with no lip at bottom edge. The compartment floors shall be raised 1" above the lower sill to prevent water from entering the bottom of the opening. Each compartment shall be fitted with a drain and located in such a manner as to minimize or eliminate water from entering.

Compartment interiors walls shall remain unpainted aluminum finish. The aluminum finish walls shall be easier to maintain, reflect light better to allow for better visibility, and prevent the masking of questionable workmanship with interior coatings.

The rear bumper trimmed out on top and sides with 1/8" aluminum tread bright. The bumper shall extend approximately 8" from the body, and be approximately 18 - 20" from the ground to the top of the tailboard, not exceed the NFPA 1901 requirements outlined in latest edition of 1901.

All exterior surface areas designated for stepping or standing shall be punch raised to provide slip resistance when stepping or walking on as outlined in the latest NFPA 1901.

FUEL AND D.E.F. FILLS

Drivers side rear wheel well with be large enough to accommodate both the chassis fuel fill and diesel exhaust fluid fills as well. Factory fuel guards shall be installed in the wheel well. Secured in place with stainless steel fasteners.

FENDERETTES / WHEEL WELL LINERS

Polished stainless steel fenderettes shall be installed across the top of the wheel openings. An extruded rubber gasket is to be installed between the fenderette and the body to reduce the possibility of electrolysis.

There shall be full radius poly wheel well liners installed. They shall extend from the springs to the outside of the body.

RUB RAILS
Full body length sacrificial aluminum rub rails shall be bolted in place on the right and left body sides. Surface of the rubrails to be smooth and be large enough to allow the installation of reflective striping. Proprietary extrusions will not be accepted!

TAIL BOARD
The rear tailboard shall be constructed from 1/8" aluminum and securely mounted to body super structure. It shall be a minimum of 10 deep and approximately 20 from ground to the tailboard. As specified in NFPA 1901-2009 edition, the tailboard shall be designed to sustain a minimum static load of 500lbs with out deformation and shall be punch raised to provide skid resistance when stepping. It shall adequately support the stepping and standing of a fire person in full turn out gear but not be used to transport firefighters.

REAR STEPS
There shall be six (5) aluminum folding steps installed on the rear of the vehicle. Three of these steps shall be installed on the left side of the rear compartment and three shall be installed on the right side of the rear compartment.

MINIPUMPER BODY (ROLL DOORS)
The compartment doors shall be of the type that rolls up on them-selves. The door shall have an adjustable tubular type counter balance which assures easy lifting and lowering of the compartment doors while eliminating the risk of accidental closing.

Doors shall be front roll up style to maximize upper compartment storage.

Door tracks shall be one-piece aluminum extrusions, which have no obstructions to bind the doors. Tracks shall have a replaceable side seal that shall inhibit water and dust from intruding into the compartments.

An aluminum drip rail shall be provided above each door with standard non-abrasive top seals to provide a water and dust barrier to keep compartment equipment clean and dry while maintaining shutter appearance.

Door slats shall be constructed from double wall box frame aluminum extrusion. Slat exteriors shall have a flat surface while the interior surface shall be concave to aid in preventing loose equipment from interfering with roll up operation.

Between each slat shall be a co-extruded inner seal to prevent metal-to-metal contact and to repel moisture from the joints.

Each door slat shall have interlocking joints with folding locking flange and end shoes secured by a swage process. The interlocking end shoes provide tight fitting operation, removing any play between-en slats and keeping graphics (if applicable) aligned. Shoes are swaged / dimpled (never riveted) into place for easy replacement.

Nested end shoes prevent metal-to-metal contact and protect the shutters from damage as the do-ors move up and down in the tracks.

Doors shall have a full width lift bar (operable by one hand), shall be used as a positive latch device for securing each individual compartment door in the closed position. All doors shall be equipped with indicator switches to alert the driver that one or more doors are not fully closed. These switches may all be connected to a single flashing warning light on the dash of the cab.

Doors shall be provided in an anodized satin finish.

Door Style: R.O.M. Robinson rollup doors

12 MiniPumper Body

Body Length 144”

Body Height 80”

Body Width 96”

Cab/Axle 84”

Approximate Compartment Dimensions:

Compartment Location	Width	Height	Depth
Driver Side L-1	51”	50”	23”
Driver Side L-2	44”	33”	23"
Driver Side L-3	31”	60”	23”
Passenger Side R-1	51”	50”	23”
Passenger Side R-2	44”	33”	23"
Passenger Side R-3	31”	60”	23”
Rear	46”	36”	72”

UNDERCOATING
The entire body will be undercoated. Body is to be completely undercoated before mounting. Undercoating body separate from the chassis ensures better coverage in to the corners and crevices with obstruction from the chassis.

CORROSION PROTECTION
The body and all of its components shall be comprehensively protected against corrosion and oxidation by contact between dissimilar metals. In an effort to provide the up most protection the use of gaskets, specially formulated compound and other corrosion resistant barriers shall be utilized wherever it is deemed necessary. The specially formulated compound shall be applied to all

fasteners, accent plates and mounted accessories installed on the body in a fashion that will create a barrier between metals, seal out moisture and prevent paint blistering from electrolysis.

Nylon washers shall be used as spacers on fasteners to prevent contact with painted surfaces where applicable

GRAB RAILS
Lighted hand rails of 1 1/4” diameter aluminum extrusion anti-slip grip, shall be mounted on the rear of the apparatus each side on the rear compartment. Hand rail shall meet or exceed the National Fire Protection Associations Pamphlet 1901. Lights integral to hand rail shall provide lighting to illuminate folding steps.

HOSE BED
There shall be a NFPA 1901 compliant hose storage area provided over top of the booster tank. The hose bed shall be approximately 48" wide by 74" long. The floor of the hose bed shall be made of aluminum sheet. Plastic compartment tile shall be used to elevate the hose off the floor. The hose bed shall be free from all objects that may pose potential harm or premature wear of the hose stored in it.

HOSE BED COVER:
The main hose bed shall have a cover made of vinyl-coated polyester installed; the covers color shall be determined by the department at the pre-construction conference. The cover shall be mechanically attached at the forward area of the hose bed while the sides of the cover shall be attached by the use of heavy duty Velcro full length of the sides.

There shall be a fill tower access panel provided in the main hose bed cover. The access shall be sewn at the forward end and have Velcro down each side and across the rear of the flap to keep it in place during transit.

The hose bed cover shall have an integral flap at the rear to cover the rear of the hose bed area. This flap shall be secured with bucklestyle restraints for ease of access to the hose in the hose bed.

HARD SUCTION STORAGE
There shall be an open compartment above the driver's side compartments for the storage of three (3) sections of hard suction hose.

The compartment shall have a treadplate door with latches to secure hose during transit.

LADDER STORAGE
Located above the officer side compartments shall be an open compartment for storage of supplied ladders. Ladder compartment shall be provided with provisions to secure two ladders separately and keep the ladders from rubbing against each other during transit. A roller shall be provided to aid in the unloaded and loading of the lower ladder from the ground.

The compartment shall have a treadplate door with latches to secure ladders during transit.

STOKES BASKET STORAGE
Located in the L1 and extending into the R1 compartments shall be a transverse storage compartment that allows for customers basket to be stored inside the body.

UPPER BODY STORAGE COMPARTMENTS
Located above the L1 and R1 body compartment shall be two small storage compartments created into head rail for additional storage. Compartments shall be as big as possible and secured with a painted aluminum swing door. Door shall be provided with a rubber gasket, a continuous stainless steel hinge and a D ring latch to secure the door.

ADJUSTABLE SHELF HARDWARE
The compartment(s) indicated shall have extrusions tracks mounted for adjustable shelving.

ADJUSTABLE SHELF
The heights of all shelves shall be easily adjustable by using P-1000 aluminum unistrut, welded permanently to the side bay walls, along with appropriate fasteners. The unistrut is to be continuous from the top to the bottom portion of the compartment.

All shelves shall be capable of supporting a minimum weight of three hundred (300) pounds.

All shelves are to be of .160" smooth aluminum with press formed flanges of 2" on all four sides and have D.A. sanded finish. Shelves shall be perforated to provide weight savings without affecting integrity.

Shelf dimensions shall vary to accommodate the specified compartment for which it is to be mounted.

There shall be six (6) adjustable shelves mounted on unistrut as per fire department instruction. There shall be one in L1, two in L3, one in R1, one in R2, and two in R3

ADJUSTABLE SLIDEOUT TRAY
The heights of all trays shall be easily adjustable by using P-1000 aluminum unistrut, welded permanently to the side bay walls, along with appropriate fasteners. The unistrut is to be continuous from the top to the bottom portion of the compartment.

The trays shall be capable of supporting a minimum weight of three hundred (300) pounds, even when fully extended.

All trays are to be of .160" smooth aluminum with press formed flanges of 2" on all four sides. Trays shall be perforated to provide weight savings without affecting integrity.

All slide trays shall be on roller mechanisms, which will allow them to extend beyond compartment by ninety percent (90%) of their overall length. An automatic latching system shall be provided to hold the slide trays in their fully retracted and extended positions. The latching system shall consist of a thumb activated spring latch and a gas charged shock to support the tray when completely extended and aid in the retraction of the tray when pushing in. No more than 20 lbs. of force shall be needed to extend or retract the tray. NO EXCEPTIONS.

Tray dimensions shall vary to accommodate the specified compartment for which it is to be mounted.

There shall be three (3) adjustable slide out tray(s) mounted on unistrut per fire department instructions. One in The L1 compartment, one in that L3 compartment and one in the R3 compartment

SLIDEOUT TOOL BOARD
All slide out tool boards shall have the capability of lateral adjustments by using P-1000 aluminum uni-strut, welded permanently to the top and bottom of the compartment, along with appropriate fasteners.

The tool boards shall be capable of supporting a minimum weight of three hundred (300) pounds, even when fully extended.

All tool boards are to be of 3/16" smooth aluminum with a formed full length handle on front and rear of the board. The board shall be mounted on ball bearing type slides which shall allow the board to roll out with the capability of locking the board in or out. Tray dimensions shall vary to accommodate the specified compartment for which it is to be mounted. There shall be one (1) slide out tool board(s) installed as per the fire department instructions in R1 compartment.

HEAVY DUTY SLIDE TRAY (SLIDE MASTER)
There shall be heavy duty slide trays installed in the specified rear compartment, as directed by the fire department. The tray is to be of .160" smooth aluminum with press formed flanges of 2" on all four sides. Tray dimensions shall vary to accommodate the specified compartment for which it is to be mounted.

Tray slides shall use heavy steel rail construction, and stainless steel ball bearings. Each tray shall extend outward of the compartment 70 percent of the tray length and shall be able to support up to a 1000 lbs. of distributed weight.

COMPARTMENT DIVIDERS
Located in the L1 and R1 compartment there shall be aluminum compartment divider to separate the compartment into two sections. The dividers shall be .160” 5052 aluminum sheet and installed as follows:

One shall be installed just aft the pump operators panel and before the stokes basket storage. This shall keep the pump operator’s panel separate from the storage in the rear portion of compartment.

The R1 divider shall be install just behind the officers side pump access panel and before the transverse stokes storage.

SCBA STORAGE IN WHEEL WELL
There shall be four (4) SCBA cylinder storage compartment recessed in the forward rearward portions of each rear wheel well. Compartments shall have a minimum depth of 23 inches. The compartment door shall be a latchable brushed aluminum type.

COMPARTMENT FLOOR TILE
Each compartment floor, all shelving and slide trays in the apparatus body shall have Black Mateflex.

PUMP
Pump shall be Waterous CP series PTO driven pump and of a size and design to mount within the chassis rails of commercial and custom truck chassis, and have the capacity of 250 gallons per minute (U.S. GPM), NFPA-1901 rated performance.

The entire pump shall be assembled and tested at the pump manufacturer's factory.

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

The pump body High tensile, close-grained gray iron casing (bronze/gunmetal optional), one-piece volute body

Pump shaft to be 17-4 stainless steel, heat-treated

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.

GEARBOX
The gearbox shall be designed of ample capacity for lubrication reserve and to maintain the proper operating temperature.

The gearbox drive and tail shafts shall be of heat-treated chrome nickel steel

Gears shall be crown-shaved, carburized and hardened helical cut, constant-mesh quiet gears. The K Transmission consists of a close-grained, gray iron casing with constant-mesh, stainless steel helical gears.

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

PTO CONNECTION
Pump and transfer case shall be equipped with an electric operated engagement system to select pump operation. Activation shall be accomplished by setting the vehicle in park, setting of the parking brake, and activation of PTO switch on console.

PRIMING PUMP
The priming pump shall be a Waterous VPOS positive displacement rotary vane type, electrically driven, and conform to standards outlined in NFPA Pamphlet No. 1901. One priming control shall both start the priming motor, and open the priming valve.

PLUMBING
All pump plumbing shall be heavy-duty stainless steel pipe. High-pressure flex hose shall be used as required. Sweep type elbows shall be used where applicable to reduce friction loss.

Victaulic or rubber couplings shall be used where necessary to allow flexing of plumbing, which will prevent damage or loosening of piping.

Pump and plumbing shall meet the standards of the latest NFPA requirements.

VALVES
All intake and discharge valves shall be Akron quarter turn, full flow valves. Each valve shall be operated by a control located on the pump panel. Any valve 3" or larger shall be provided with a slow close feature.

PUMP MODULE & PUMP PANEL
The pump assembly and pump panel shall be installed completely in the front L1 compartment and concealed behind the roll up door.

The pump house operator's panel shall be constructed from stainless steel and shall be removable in order to access the internal pump house.

Above operators side pump panel, there shall be stainless steel hinged instrument panel to access the pump house gauges. The panel or instrument panel shall be horizontally hinged for maintenance and gauge inspection. The panel shall be hinged using a continuous stainless steel hinge and be operated by a two (2) Eberhard style trigger latches.

Controls for pump system will be accessible at the side mounted operators panel.

The upper portion of the operator's panel extend upward to provide an illumination hood for panel lights. Under this hood there will be a series of LED lights with switch located on the pump panel.

The side mount valve controls will be T handle type. The valve control levers will extend through the side panels and be supplied with a twist lock device. The valve control levers will utilize direct linkage and will be uniformly grouped with each respective gauge.

All controls, discharge and suction gauges are to be identified at the gauge and discharge and suction points as well as open-closed positions with identification plates of color background and natural letters.

Pump discharge and suction inlets will extend through vinyl-clad aluminum panels at each side of the apparatus. The 3/4 drain valves for each of the 2-1/2 or larger side discharges will be supplied.

INSTRUMENT PANEL
The instrument panel must contain the following gauges and equipment. These are to be located according to N.F.P.A. 1901 applicable codes.

A -30-0-600 PSI 3-1/2 master suction and pressure gauge will be supplied along with 2-1/2 compound pressure gauge for each discharge 1-1/2 or larger unless otherwise specified. The specified pressure gauge will be located directly be of the liquid silicone filled type. Water pressures and suction gauges will be filled with liquid silicone solution to assure visual reading to with 1% accuracy and function accurately in sub-zero temperatures.

This liquid silicone gauges eliminates the need of snubber valves.

PRESSURE GOVERNOR and ENGINE MONITORING DISPLAY
Fire Research PumpBoss series PBA406-C00 pressure governor and monitoring display kit shall be installed. The kit shall include a control module, intake pressure sensor, discharge pressure sensor, and cables. The control module case shall be waterproof and have dimensions not to exceed 6 3/4" high by 4 5/8". The control knob shall be 2" in diameter with no mechanical stops, have a serrated grip, and a red idle push button in the center. It shall not extend more than 1 3/4" from the front of the control module. Inputs for monitored engine information shall be from an installed J1939 Translator Module. Outputs for engine control shall be on engine specific wiring. Inputs from the pump discharge and intake pressure sensors shall be electrical.

The following continuous displays shall be provided:

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

The dot-matrix message display shall show diagnostic and warning messages as they occur. It shall show monitored apparatus information, stored data, and program options when selected by the operator. All LED intensity shall be automatically adjusted for day and 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 module. There shall be a USB port located at the rear of the control module to upload future firmware enhancements.

The governor shall operate in two control modes, pressure and RPM. No discharge pressure or engine RPM variation shall occur when switching between modes. A throttle ready LED shall light when the interlock signal is recognized. The governor shall start in pressure mode and set the engine

RPM to idle. In pressure mode the governor shall automatically regulate the discharge pressure at the level set by the operator. In RPM mode the governor shall maintain the engine RPM at the level set by the operator except in the event of a discharge pressure increase. The governor shall limit a discharge pressure increase in RPM mode to a maximum of 30 psi. Other safety features shall include recognition of no water conditions with an automatic programmed response and a push button to return the engine to idle.

The pressure governor and display shall be programmed to interface with a Ford 6.7L diesel engine.

The following instruments and controls will be supplied at the operator's panel:

One (1) -30 x 600 PSI chrome 3 -1/2 main pressure gauge.
One (1) -30 x 600 PSI chrome 3 -1/2 main suction gauge
One (1) 0 x 600 PSI chrome 2-1/2 individual pressure gauges for each 1-1/2 or larger discharge.
One (1) FRC Pump Boss
One (1) lighted level water gauge.
One (1) engine cooler control.
One (1) tank fill control.
One (1) pump to tank control.
Pump cooling controls.
Pump discharge controls.
Primer control
U.L. test plug panel.

LABELS
Each control and gauge will be clearly marked by a color coded name plate, permanently affixed to the operators panel.

All discharge and suction gauges are to be identified at the gauge and discharge and suction points as well as open-closed positions with identification plates of black background and natural letters.

TANK TO PUMP
The tank to pump valve shall be a 2.5" Air operated valve, installed between the water tank and the pump. Controls for the valve shall be provided on the operators control panel.

TANK FILL
One (1) 1 " inline valve shall be supplied off the discharge side of pump and be plumbed into the front head of the tank using high pressure hose.

LEFT SIDE DISCHARGES
There shall be two (1) 2.5" quarter turn discharge valve(s) shall be provided behind the left side pump panel. Control for discharge valve shall be provided on operators pump panel. The discharge(s) shall terminate with a 30 degree elbow with male NST threads, and have a high polished chrome cap with chain. Each discharge is to be equipped with a .750" push/pull drain valve. Drains shall discharge below the running board. The discharge is to have a 2.5" Class 1, SubZII compound gauge.

CROSSLAYS
There shall be one (1) divided double crosslay hosebed capable of holding 200 feet of 1. 75" hose in each section installed above the pump house. The hose bed is to be constructed of perforated aluminum flooring for maintenance free service. The hosebed divider shall be installed on an aluminum track to allow the department adjustability.

The crosslay shall be equipped with 2" swivels, 2" plumbing, and high pressure reinforced hose. Controls for the croslay shall be provided at the operator's panel. A 2.5” Class 1, Sub ZII gauge shall be supplied for each crosslay.

SUCTION
One (1) 2.5” auxiliary suction valve with chrome female swivels and NST threads shall be provided and be mounted on left side pump panel.

FOAM SYSTEM
The apparatus shall be equipped with an electronic, fully automatic, variable speed, direct injection, rotary gear pump, discharge side foam proportioning system, The system shall be capable of handling Class A foam concentrates. Foam proportioning operation shall be based on direct measurement of water flow, and remain consistent within the specified flows and pressures.

The system shall be equipped with an electronic control unit, suitable for installation on the pump operator panel, that provides digital indication of system operation. Incorporated within the control unit shall be a microprocessor that receives input from the system flowmeters, while receiving input as to foam concentrate pump output, comparing these values to ensure the operator preset proportional amount of foam concentrate is injected into the discharge side of the fire pump.

A paddle wheel type flow meter shall be installed in the discharge specified to be foam capable.

The control unit shall enable the pump operator to activate the foam proportioning system and select proportioning rates from 0.1% to 1.0%.

A 12 volt electric motor driven positive displacement plunger pump, with a rated capacity of 1.7GPM (6.4 L / PM) with operating pressures up to 200 PSI, shall be installed in a suitable location on the apparatus. The motor shall be controlled by the microprocessor. It shall receive signals from the control module, and power the 1/3 HP electric motor in a variable speed duty cycle to ensure 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 the foam from contaminating the pump and tank. A PSI opening pressure check valve shall also be provided in the concentrate line.

POLY TANK

The tank shall have a capacity of 300 U.S. gallons complete with a Lifetime Warranty. The tank manufacturer shall mark the tank and furnish notice that indicates proof of warranty. The purpose of the markings and notice is to inform department personnel who store, stock, or use the tank that the unit is under warranty. Markings may be brief but should include a short statement that a warranty exists, the substance of the warranty, its duration, and who to notify if the tank is found to be defective.

CONSTRUCTION

The UPF POLY-TANK®IIE shall be constructed of 1/2" thick PT2E™ polypropylene sheet stock. This material shall be a non-corrosive stress relieved thermoplastic, natural in color, and UV stabilized for maximum protection.

The booster tank shall be of a specific configuration and is so designed to be completely independent of the body and compartments. All joints and seems shall be nitrogen welded and tested for maximum strength and integrity. The top of the booster tank is fitted with removable lifting eyes designed with a 3 to I safety factor to facilitate easy removability. The transverse swash partitions shall be manufactured of 3/8" PT2E™ 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" PT2E™ 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.

FILL TOWER AND COVER

The tank shall have a combination vent and manual fill tower. The fill tower shall be constructed of 1/2" PT2E™ 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 by the purchaser in Special Provisions. The tower shall have a 1/4" thick removable polypropylene screen and a PT2E™ polypropylene hinged-type cover. Inside the fill tower, approximately 4" down from the top, shall be fastened a combination vent overflow pipe. The vent overflow shall be a minimum of schedule 4O polypropylene pipe with a minimum I.D. of 4" that is designed to run through the tank, and shall be piped behind the rear wheels where specified by the purchaser in Special Provisions so as to maximize traction.

The tank cover shall be constructed of 1/2" thick PT2E™ polypropylene, natural in color, and UV stabilized, to incorporate a three-piece locking 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 will assist in keeping the covers rigid under fast filling conditions. A minimum of two lifting dowels shall be drilled and tapped ½-13 to accommodate the lifting eyes.

SUMP
There shall be one (1) sump standard per tank. The sump shall be constructed of 1/2" PT2E™ polypropylene and be located in the left front quarter of the tank, unless specified otherwise in Special Provisions. On all tanks that require a front suction, a 3" schedule 40 polypropylene pipe shall be installed that will incorporate a dip tube from the front of the tank to the sump location. The sump shall have a minimum 3" N.P.T. threaded outlet on the bottom for a drain plug. This shall be used as a combination clean-out and drain. All tanks shall have an antiswirl plate located approximately 2" above the sump.

OUTLETS
There will be two (2) standard tank outlets: one for tank-to-pump suction line, which shall be a minimum of 3" N.P.T. coupling; and, one for tank fill line, which shall be a minimum of 3" pipe, N.P.T. coupling. All tank fill couplings shall be backed with flow deflectors to break up the stream of water entering the tank, and be capable of withstanding sustained fill rates of up to 1000 G.P.M. The addition of rear suction fittings, nurse valve fittings, dump valve fittings, and through the tank sleeves to accommodate rear discharge piping must be specified in Special Provisions. All auxiliary outlets and inlets most meet all NFPA 1900 guidelines in effect at the time of manufacture.

MOUNTING
The UPF POLY-TANK®IIE shall rest on the body cross members in conjunction with such additional cross members, spaced at a distance that would not allow for more than 530 square inches of unsupported area under the tank floor. In cases where overall height of the tank exceeds 40 inches, cross member spacing must be decreased to allow for not more than 400 square inches of unsupported area.

The tank most be isolated from the cross members through the use of hard rubber strips with a minimum thickness and width dimension of 1/4 x 2 and a minimum Rockwell Hardness of 60 durometer. Additionally, the tank must be supported around the entire bottom outside perimeter and captured front and rear as well as side-to-side to prevent tank from shifting during vehicle operation.

Although the tank is designed on a free floating suspension principle, it is required that the tank has adequate hold down restraints to minimize movement during vehicle operation. The tank shall be completely removable without disturbing or dismantling the apparatus structure.

INTEGRAL FOAM CELL
There shall be a 12 US gallon integral foam cell integrated into the booster tank. Cell shall be equipped with a fill tower and a drain to flush out the cell.

WATER LEVEL INDICATOR
A Class One Intella-Tank water level system with ultra-brite L.E.Ds for better visibility shall be provided, to monitor the tank water levels. It functions by use of an industrial pressure transducer. Unit self calibrates to any size/shape tank regardless of dimensions and uses pressure sensor, no tank probe to size & maintain. Unit utilizes a one wire data link for unlimited displays and provides operator with built in diagnostics. System shall utilize ultra-brite LED indicators that shall provide the operator with nine accurate levels of indication. As an added feature the system offers a programmable night dimming.

FOAM LEVEL INDICATOR
A Class One Intella-Tank foam level system with ultra-brite L.E.Ds for better visibility shall be provided, to monitor the tank water levels. It functions by use of an industrial pressure transducer. Unit self calibrates to any size/shape tank regardless of dimensions and uses pressure sensor, no tank probe to size & maintain. Unit utilizes a one wire data link for unlimited displays and provides operator with built in diagnostics. System shall utilize ultra-brite LED indicators that shall provide the operator with nine accurate levels of indication. As an added feature the system offers a programmable night dimming.

12-VOLT ELECTRICAL SYSTEM REQUIREMENTS

GENERAL REQUIREMENTS:

All electrical work shall be performed by persons familiar with emergency vehicle systems.

All of the emergency electrical equipment shall be served by circuits separate and distinct from the vehicle chassis circuits.

The 12-Volt DC electrical system shall controlled by an industry proven electrical system.

WIRING REQUIREMENTS:

The complete 12-volt wiring system and electrical appliances shall meet NFPA 1901 minimum standards as well as standard automotive practices throughout the installation in the apparatus. The system shall comply with all the appropriate SAE recommended practices such as J1939 and/or J1708.

All required DC power conducting wiring shall be of GXL stranded copper wire of adequate gauge for the function served so as to ensure voltage drop of less than one volt at the appliance under full amperage load.

Body wiring shall be color and function coded, grease, oil and moisture resistant, routed in protective loom through protected locations, neatly and securely fastened, and all apertures properly grommeted for passing wiring. Solderless insulated connectors shall be provided where required. Primary wiring harnesses shall be bench assembled. Where crimp connections are necessary, the connections shall be made using approved connectors with heat shrink insulators. Any wiring routed within proximity of any exhaust components or other high temperature components shall be given special consideration and shielded for best protection.

Any required signal conductors shall be shielded twisted pairs rated by the system manufacturer to carry the multiplex command signals from the switch panel to the control modules.

ELECTRICAL MANAGEMENT SYSTEM:
The system installed shall be easily re-programmable and reconfigurable. Most factory authorized service centers or technicians will have on hand all required diagnostic hardware and software required for maintenance of the installed system.

PC PROGRAMMING:
The system must be programmable at the factory in a language that can be downloaded to a remote dealer or service representative's PC or down loader tool with all OEM data, as programmed for this specific unit and allow field reprogramming changes as provided by the unit manufacturer.

EMI/RFI PROTECTION:
The electrical system proposed shall include means to control undesired electromagnetic and radio frequency emissions. State of the art electrical system design and components will be used to insure radiated and conducted EMI (electromagnetic interference) and RFI (radio frequency interference) emissions are suppressed at their source.

The unit proposed will have the ability to operate in the electromagnetic environment typically found in fire ground operations. The contractor will be able to demonstrate the EMI and RFI testing has been done and meets SAE J551 requirements. Harness and cable routing be given careful attention to minimize the potential for conducting and radiated EMI/RFI susceptibility.

CONTROLS & FUNCTIONS:
A switch panel controlling electrical devices and equipment installed on the chassis and body shall be located in the cab within easy access to the driver or centrally located convenient to the driver and/or officer positions. The panel shall include switches arranged in the most convenient and practical manner that is possible.

The panel shall control individually all emergency warning light circuits, which shall also be controlled by warning master switch.

The system will include, at a minimum, the following attributes and improvements over analog type systems: messages and status indicators.

- Minimize use of control relays
- Provide control for NFPA 1901 mandated interlocks and indicators.
- Utilize system integration to eliminate redundant wiring and components
- Improve control system reliability by reducing relay and contactor contacts.
- Advanced electrical system load management and sequencing system
- Imbedded service interval information.
- Customized software programmed to reflect configuration.
- Field re-programmable to accommodate changes to the unit operating parameters.
- Fully Documented hardware

SERVICE AND MAINTENANCE DIAGNOSTIC:
Advanced unit service and maintenance will be assisted with an integral software program. The software will provide troubleshooting tools to service technicians. Easy to understand diagnostic procedures.

- Automatic failure detection.
- Appropriate warning regarding components
- System simulation and pinging of nodes for status verification.

All electrical and emergency lighting equipment and circuits not controlled by the electronic management system shall be supplied with automatic reset circuit breakers of appropriate amperage. These circuits shall be operated through a Bosch or equal continuous duty relay to remove load from all switches.

12V DC VOLTAGE OUTPUT TESTING & DOCUMENTATION:
The low voltage system of the completed apparatus shall be tested and certified by the manufacturer prior to delivery. A copy of the testing and successful completion will be provided to the purchaser with the in the Owners Manual. Any failures to these tests will require corrective actions to be taken and re-tested before delivery.

RESERVE CAPACITY TEST:
The engine shall be started and run until all engine and engine compartment temperatures are stabilized and the battery system is fully charged. The engine shall be shut off and the minimum continuous electrical load shall be activated for ten (10) minutes. All electrical loads shall be shut down. The battery system shall then be capable of restarting the engine.

ALTERNATOR PERFORMANCE TEST AT IDLE:
Minimum continuous electrical load shall be activated while the unit is at idle speed. The engine and engine compartment temperatures are stabilized. 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.

ALTERNATOR PERFORMANCE TEST AT FULL LOAD:
The total continuous electrical load shall be activated with the engine running up to the manufacturer's governed speed. The test duration shall be a minimum of two (2) hours. Activation of the load management system shall be permitted during the test. If however, an alarm sounded by excessive battery discharge, as detected by the system, or a voltage of less than 11.7 volts DC for a 12-volt nominal system for more than 120 seconds, it shall be considered a test failure.

LOW VOLTAGE ALARM TEST:
The engine shall be shut off and the total continuous electrical load shall be activated and continue to be applied until the excessive battery discharge alarm is activated. The battery voltage measured at the battery terminals with the load still applied must be above 11.7 volts or the test shall be considered a failure and corrective actions employed.

DOCUMENTATION:
At the time of delivery an Amp Draw Report Section 13-15 will be completed and provided to the purchaser with the Owners Manual. Documentation shall include:

1. Copy of electrical system performance test complying with NFPA 1901,

2. Written load analysis with the following information:
a. Nameplate rating of the alternator
b. The alternator rating under the conditions specified NFPA 1901, section 13.3.2.
c. The minimum continuous load of each component specified per NFPA 1901 section 13.3.2
d. Additional electrical loads that, when added to the minimum continuous electrical load,

determine the total electrical load.

e. Each individual intermittent electrical load

BATTERY DISCONNECT SWITCH

A Cole Hersey brand M-284-01 master battery disconnect switch shall be installed in a convenient location to the driver.

BATTERY LIGHT

A green "battery on" pilot light that is visible from the driver's position shall be provided.

STOP / TAIL / TURN / BACKUP LIGHTS

Body shall be equipped with stop, tail, turn and back up lights as required by Federal Motor Vehicle Safety Standards.

New stop/tail, turn and back-up lights, shall be installed according to the FMVSS requirements. The stop, tail, turn light type used shall be TecNiq brand K series L.E.D lights installed in individual chrome housings mounted to the rear of the apparatus

CLEARANCE / MARKER LIGHTS (L.E.D)

The apparatus body shall be equipped TecNiq brand L.E.D marker lights. Lights shall be of the proper color and in accordance with the Federal Motor Vehicle Safety Standards (FMVSS).

A license bracket shall be provided at the rear of the unit with required LED lighting.

BACKUP ALARM

An Ecco brand backup alarm shall be installed and shall be activated when the unit is placed in reverse gear.

COMPARTMENT LIGHTS

The body compartments shall be equipped with low voltage, light emitting diode (LED) strip style lighting. Each light strip shall be consist of a single LED placed every 1.5" in cased in a durable and impact resistant translucent shield to protect the diodes from inadvertent contact or collision which may result in damage. The lights shall be mounted vertically in each compartment where they will not interfere with adjustment or accessibility of any shelving or equipment.

Each light shall be sized accordingly to illuminate the compartment adequately.

COMPARTMENT OPEN LIGHT

A large red light shall be mounted in the cab visible from the driver's and officer's seat.

Each compartment door shall be equipped with a door open indicator switch. When contact is broken at these switches, it shall activate the compartment open light in the cab.

ENGINE COMPARTMENT LIGHT

There shall be one (1) light installed in the engine compartment to illuminate the engine area. There shall be a switch located adjacent to or on the light.

PUMP COMPARTMENT LIGHT
There shall be one (1) LED light installed in the pump compartment to illuminate the pump house area. There shall be a switch located adjacent to or on the light.

GROUND AREA LIGHTING
There shall be six (6) high intensity LED water resistant lights mounted under the unit to provide proper ground area illumination in areas designed for the personnel to climb onto or descend from the apparatus.

LIGHT BAR
A Whelen Justice model JE2NFPA 56" L.E.D. light bar shall be installed on the cab roof of the unit. There shall be four (4) red L.E.D light heads and two (2) white L.E.D's.

There shall be two modes of operation, calling for the right-of-way and blocking the right-of-way. When the master optical; warning system switch is closed, and the parking brake is released or the automatic transmission is not in park, the warning devices signaling the call for right-of-way shall be energized. When the master optical warning system switch is closed, and the parking brake is on or the automatic transmission is in park, the warning devices signaling the blockage of the right-of-way shall be energized.

LOWER ZONE WARNING LIGHTS
An NFPA 1901 L.E.D. lower zone warning light package shall be installed on the unit.

There shall be a total of six (6) Whelen LINZ6R super LED warning lights mounted on the unit.

Lights shall be mounted as follows:

There shall be two (2) TecNiq K series 7” x 3” LED red lights installed in each of the rear wheel wells (Lower Zone A)

There shall be a total of two (2) Whelen LINZ6R super LED warning lights mounted on the unit. One (1) on the left side of the unit towards the front mounted in a chrome housing (Lower Zone B) One (1) on the right side of the unit towards the front mounted in a chrome housing (Lower Zone D)

There shall be two (2) TecNiq K series 7” x 3” LED red lights installed in each of the rear wheel wells (Lower Zones B & D)

UPPER ZONE WARNING LIGHTS
An NFPA 1901 L.E.D. upper zone warning light package shall be installed on the unit.

There shall be a total of Six (2) TecNiq K series 7” x 3” LED red lights provided on the body. Each light shall be equipped with a chrome flange. Lights shall be mounted as follows:

Two (2) red TecNiq K series 7” x 3” LED red lights mounted on the upper rear of the unit, one each side (Upper Zone C)

Two (2) red TecNiq K series 7” x 3” LED red lights mounted on the upper rear of the unit, one each side (Upper Zone C)

ELECTRONIC SIREN
There shall be one (1) Whelen model 295SLSA1 200-watt self-contained siren with electronic noise canceling microphone shall be installed in the cab area.

SPEAKER
There shall be one (1) compact Cast Product SH2015 flush mount speaker with 100 watt driver and a polished finish will be supplied. It will be mounted on the front chassis bumper symmetrically balanced in the front.

SCENE LIGHTS
The unit shall be equipped with six (6) TecNiq K series LED scene lights. Scene lights shall be located two (2) on the upper left side, two (2) on the upper right side and two (2) on the upper rear of the apparatus.

BATTERY CONDITIONER
There shall be a Kussmaul Auto Charge kit installed on the chassis. It shall consist of an Auto Charge1000 120 volt AC battery conditioner with Auto Eject, and remote bar graph.

The battery conditioner (charger) system shall be wired to the chassis batteries and will recharge them to required levels. Conditioner shall provide a full 15 amps of output as well as supplying up to 3 amps for loads connected directly to the battery such as radio memory, etc. System shall be connected through a 110-volt shoreline inlet or receptacle located in a department specified location. A 10 element LED charge indicator shall be mounted on the near the shoreline inlet.

The shoreline inlet shall be a Kussmaul Auto-Eject input connector with a weatherproof cover. Auto Eject is designed to connect a 120-volt AC source to the vehicle. Unit shall automatically disconnect 120 volt AC power source by ejecting plug from the receptacle when vehicle-starting system has been energized. Eject shall be securely mounted in the driver side rear wheel well of the unit.

120 VOLT & 240 VOLT

Since the apparatus will be equipped with a 120/240 volt electrical system, the wiring and associated equipment shall be tested.

The wiring and associated receptacles shall be subjected to a 1-min, 900-V dielectric voltage withstand test with any switches in the circuit(s) closed between live parts, including neutral and the vehicle frame. This test shall be conducted after all body work has been completed.

Electrical polarity checks shall be made of permanently wired equipment and receptacles to determine that connections have been properly made.

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.

The results of the test shall be recorded and provided to the purchaser at the time of delivery.

GENERATOR

There shall be a customer supplied portable generator installed into rear center compartment in slide out tray.

OUTLETS

Two (2) 120 volt 15amp twist lock outlets shall be installed per the fire department request on the rear of the apparatus adjacent to each tripod light location. The outlets shall be mounted one in each side of rear body compartment. Lights shall be pigtailed to the rear compartment where they can be plugged into generator

TELESCOPIC TRIPOD 500 WATT FLOODLIGHT

Two (2) Fire Research Optimum model OPA656-S50 tripod telescopic lights shall be provided. The light pole shall be anodized aluminum and have a knurled twist lock mechanism to secure the extension pole in position. The extension pole shall extend 28" and rotate 360 degrees. An internal brake shall slow the extension pole during lowering. The outer pole shall be a grooved aluminum extrusion. The folding legs shall be anodized aluminum tubing with plastic endcaps. The fully extended tripod system shall exceed a height of 8' and be less than 5' when collapsed. Wiring shall extend from the pole bottom with a 4' retractile cord.

The lamphead shall have one (1) quartz halogen 500 watt 120 volt bulb. The bulb will draw 4.2 amps and generate 10,500 lumens. The bulb shall be accessible through the front. The lamphead shall incorporate a vacuum deposit polished reflector and two optimizing mirrors to produce a uniform beam that lights up an area 100° vertically by 150° horizontally. The lamphead shall have a heat dissipating curved front lens. The curve of the lens shall have a radius of 5.16 inches to optimize light emission. The lamphead shall be no more than 4 3/4" deep by 5 1/8" high by 8 3/4" wide. Lamphead and brackets shall be powder coated white.

Location of floodlight shall be:

Two (2) on the rear of the apparatus, one (1) each side of rear compartment.

PAINT

The body exterior shall have no mounted components prior to painting to assure full coverage of metal treatments. Compartment doors will be painted separately to assure proper paint coverage on body, door jambs and door edges.

All painted surfaces shall follow the following procedure to insure a lasting finish.

Metal surfaces shall be sanded to remove all burrs and imperfections in aluminum, before etching and treatment.

A wax & grease solvent shall be used to clean and prep the aluminum surface. The surface shall then be rinsed with freshwater. This step removes wax, grease and other surface contaminants, thus leaving a bright, clean and conditioned surface.

A self etching, aluminum primer shall be applied next. The self-etching primer shall fill all of the minor imperfections, scratches, etc. in the metal. This step produces a corrosion resisting conversion coating that fends off oxidation and other surface contaminates leaving a surface that gives excellent paint adhesion.

A sandable primer shall be sprayed on the metal, that seals the surface for the polyurethane paint. A minimum coating thickness of 2 mil shall be applied. Primer is then sanded smooth leaving the best surface for top coat.

The apparatus body shall then be painted with a minimum of three (3) coats of enamel paint to match chassis color.

These steps are followed as recommended by the paint manufacturer to provide a lasting and high quality gloss finish. All paint products shall be provided by the same manufacture as the top coat finish.

BODY UNDERCOATING

The entire under body shall be undercoated with an automotive grade undercoating.

CORROSION PROTECTION

The body and all of its components shall be comprehensively protected against corrosion and oxidation by contact between dissimilar metals. In an effort to provide the up most protection the use of gaskets, specially formulated compound and other corrosion resistant barriers shall be utilized wherever it is deemed necessary. The specially formulated compound shall be applied to all fasteners, accent plates and mounted accessories installed on the body in a fashion that will create a barrier between metals, seal out moisture and prevent paint blistering from electrolysis.

Nylon washers shall be used as spacers on fasteners to prevent contact with painted surfaces where applicable

LETTERING
There shall be a maximum of sixty (60) 3" tall 3M reflective gold letters applied to the apparatus. The lettering shall also have a left drop shading applied. The exact location of the lettering shall be supplied by the department.
Lettering shall read:
REEDY VOL. (Arched - Each Cab Door)
FIRE DEPT. (Arched - Each Cab Door)
R-60 (Each Cab Fender)

LETTERING
There shall be a maximum of sixteen (16) 6" tall 3M reflective gold letters applied to the apparatus. The lettering shall also have a left drop shading applied. The exact location of the lettering shall be supplied by the department.
Lettering shall read: RESCUE 60 (Each Compartment Door Above Rear Wheels)

LETTERING
There shall be a maximum of eight (8) 10" tall 3M reflective gold letters applied to the apparatus. The lettering shall also have a left drop shading applied. The exact location of the lettering shall be supplied by the department.
Lettering shall read: RESCUE 60 (Rear Cargo Door)

NFPA STRIPE
There shall be a 4" wide, white Scotchlite stripe located no higher than 48" from the ground installed on the apparatus cab and body. The stripe shall cover a minimum of fifty percent (50%) of perimeter of each side of the apparatus and twenty-five (25%) of the perimeter of the front of the apparatus. The department shall specify the exact location of the stripe.

CONSPICUITY STRIPING
3M Conspicuity highly reflective prismatic striping shall be installed along the apparatus rub rails. Vehicle markings are made for application to sides and rear of emergency vehicles to meet and exceed all US DOT and NHTSA and NFPA requirements.

CAB DOOR REFLECTIVE STRIPING
The completed apparatus shall be equipped with reflective material on the interior of each cab door in accordance with the current standards of NFPA.

DECALS
There shall be two (2) 15" Scotchlite reflective maltese crosses supplied and installed on the unit. A maltese cross shall be installed on the driver's door and the other to be installed on the officer's door.

ALTERNATING "CHEVRON" STYLE STRIPE (NO REAR DOOR)
The rear of the apparatus not including the roll up door shall be overlaid with alternating red and amber reflective 6” stripes. Stripes to be configured to resemble in a “Chevron” style lay out where the stripes come in from the sides at an upward 45 degree angle converging in the center to provide an upward point.

LOOSE EQUIPMENT

One (1) 36” hooligan tool

One (1) 30” hooligan tool

Two (2) TNT tools with 30” handles

One (1) 36” bolt cutter

One (1) complete Glass-Master windshield tool

Two (2) Fire Vulcan LED lights

One (1) Akron #443 Hydrant / spanner wrench set with holder

Three (3) 50’ sections of 1-3/4” DJ800 polyester hose with 1-1/2” NST couplings

Four (4) 50’ sections of 1-1/2” DJ800 polyester hose with 1-1/2” NST couplings
* Hoses to be stenciled “REEDY VFD”

Three (3) 2-1/2” x 10’ PVC suction hose with RLM x RLF couplings

One (1) Akron EJB2300 electrical junction box with treadplate vertical mounting bracket

One (1) Duo Safety 1275FR folding roof ladder

One (1) Duo Safety 701 series 10’ attic ladder

WHEEL CHOCK
There shall be two (2) Zico model SAC-44 wheel chocks with a horizontal hanging bracket shall be mounted in front of the left rear wheels.

ASSORTED FASTENERS
One (1) bag of assorted stainless steel, and chrome fasteners used in the assembly of the apparatus shall be provided with the delivery of the apparatus.

WIRING SCHEMATICS
A complete set of detailed electrical wiring schematics shall be provided with the completed unit. The schematic shall clearly labeled and describe all electrical circuits for an accurate reference.

SERVICE MANUAL AND PARTS LIST
Two (2) service manuals shall be provided with the completed unit. Manuals shall include equipment and component information as well as warranty and service information.