

SPECIFICATIONS

FOR

TOLLESBORO
FIRE DEPARTMENT

ON A

MIDI-PUMPER/RESCUE TRUCK

PERFORMANCE BOND

A 100% Performance bond shall be provided within 30 days after receipt of the awarded contract. The performance bond shall be furnished by the bidder of the apparatus proposed. Performance bonds by salesman or agents of manufacturer are not acceptable. NO EXCEPTIONS.

APPROVAL DRAWINGS

There shall be a complete set of drawings that are designed from the specifications and/or any change orders signed by the purchaser before construction begins. These drawings shall indicate the chassis make and model, location of lights, siren, horns, compartments and all major components of the unit. The signed drawings will become part of the contract documents. NO EXCEPTIONS.

DELIVERY

The completed unit shall be delivered to the Fire Department at a destination determined by the fire department. The unit shall be delivered under its own power - rail or truck shall not be acceptable.

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 seven (7) years or 84,000 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 five (5) years or 50,000 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

MANUFACTURER: Chevrolet
MODEL: CC5500 Crew Cab 4x4

See chassis specification section for complete details.

BUMPER EXTENSION

The front bumper and frame shall be extended 16" for miscellaneous uses. A 9" channel shall be mounted directly behind the front bumper for additional strength.

A 3/16" bright aluminum tread plate apron shall be installed between the bumper and front face of the cab. Stainless steel screws shall be used to attach the apron to the bumper flange.

FRONT BUMPER HOSE TRAY

There shall be a hose storage area integrated into the front bumper extension. Storage well shall accommodate 100' of 1.50" double jacket Cotton-Polyester hose.

The hose well shall be constructed of .125" aluminum. The well shall be mounted between the extension rails. A bright aluminum treadplate cover shall be provided over the hose tray.

The cover shall be attached with a full-length stainless steel hinge. A lift and turn latch shall secure the cover in the closed position and a pneumatic cylinder's shall hold the cover in the open position.

Drain holes shall be provided in the hose tray as well as Mateflex black plastic floor grating tiles.

EXHAUST SYSTEM

The exhaust shall remain intact as supplied by the chassis manufacturer for compliance with the 2007 emission standards.

HIGH IDLE

There shall be a high idle setting provided in the cab. The high idle shall automatically maintain a preset engine RPM. This controller shall be designed and provided by the chassis manufacturer.

RADIO ANTENNA MOUNT

There shall be one (1) radio antenna mounting base model MA with 18 ft of coax cable and weatherproof cap provided for the two-way radio.

The mount shall be located on the cab roof just to the rear of the front cab seats. The cable shall be routed to the console area, enough cable for the customer to route the cable to the instrument panel area shall be provided.

CHASSIS STEPS

There shall be a set of light duty aluminum tread brite running boards (minimum .190" thickness) installed on the light duty crew cab chassis.

The step shall be of a comfortable height for entering or leaving the cab. The steps shall be so arranged so that a fireperson wearing heavy boots and turnout gear can easily gain access to all cab doors. The boards shall be of heavy constructed and well supported and braced the entire length of the cab.

The steps shall provide anti slip protection and shall be constructed of a raised punch aluminum diamond tread plate.

There shall be a storage compartment with hinged door, each cab step area provided space is available.

FRONT TOW HOOKS

Two (2) chromed steel two hooks shall be installed under the front bumper and attached to the front frame members. The tow hooks shall be designed and positioned to allow up to 6,000 lb straight horizontal pull in line with the centerline of the vehicle. The tow hooks shall NOT be used for lifting of the apparatus.

REAR TOW EYES

There shall be two (2) painted tow eyes mounted directly to the truck frame rails through recessed cast aluminum housing located in the rear compartment and capable to with stand the requirements of towing (not lifting) the apparatus without damage.

CAB CONSOLE

Between the two front seats, a console shall be constructed of .125" aluminum painted black. The console shall have room for emergency switch panel, siren and map storage.

UNFINISHED WHEELS

The wheels on chassis shall remain as supplied on the chassis by the chassis manufacturer.

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.

FRONT MUD FLAPS

There shall be a set of front anti spray black mud flaps shall be installed behind the front wheels.

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

The apparatus body shall be constructed of minimum 1/8" 5052 alloy aluminum sheet and extrusions. Body and subframe shall be aluminum, NO EXCEPTIONS.

The subframe shall consist of aluminum alloy extrusions electrically welded both sides at each joint with 5356 aluminum alloy welding wire. All aluminum extrusions shall be 6061T6 or 6063T6 alloy.

The complete apparatus body shall be all welded construction, free from nuts, bolts and other fasteners. The complete apparatus body and subframe shall be free from all burrs and sharp edges.

The main body support crossmembers shall consist of 2" x 4" x 1/4" aluminum "tube. The front compartment crossmember shall consist of 2" x 4" x 1/4" aluminum "tube. These crossmembers shall extend the width of the body to support the compartment framing.

Tank support crossmembers shall consist of 4" 2" x 4" x 1/4" aluminum "tube. These crossmembers shall extend the width of the tank and be installed on 15" centers.

The frame rail extrusion 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 "C" with a web thickness of .180.

The apparatus body/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 side walls shall be .125 aluminum plate securely welded and gusseted to subframe crossmembers. The compartment ceilings shall be smooth aluminum.

Compartment floors shall be of sweep-out design formed from .125 aluminum plate. Compartments shall be adequately vented and drained with baffles installed to prevent water from entering from outside.

There shall be a .250" hole installed in the lower corners of the inside door pans for drainage. The doors shall have a closed cell neoprene rubber gasket installed around the perimeter of the door to carry off water.

There shall be a hose storage area provided over top of the booster tank and rear of the truck. The floor of the hose bed shall be made of 3/4" x 3" aluminum hose bed extrusion ribbed on top. The extrusions shall be welded together with 3/4" spacing to vent the hose bed and remain removable. The hose bed shall be free from all objects that may pose potential harm or premature wear of the hose stored in it.

Two light stanchions shall be provided on the upper rear of the apparatus. One stanchion shall be mounted on each side of the hose bed. Each stanchion shall provide adequate mounting for upper zone C warning beacon. Stanchion shall be trimmed with a polished brite finish and provide protection for light wiring.

The rear tailboard shall be constructed from 3/16 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 1901-2003 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.

Polished aluminum 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 wheel liners installed. They shall extend from the springs to the outside of the body.

PUMPER BODY (ROLL DOORS)

The compartment doors shall be of the type that rolls up on themselves. 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.

Door slats shall be constructed from 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 doors 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 side compartment doors shall be painted job color. The rear compartment door shall remain un-painted anodized finish.

DOOR GUARDS

The seven (7) compartment doors shall include a guard / drip pan designed to protect the roll-up door from damage when in the retracted position and to contain any water spray. The guard shall be fabricated from stainless steel and installed in each compartment.

The compartments shall be configured as follows:

Left Side:

The L-1 left side compartment behind the cab shall measure approximately 34" wide by 64" tall by 23" deep.

The L-2 over the wheel left side compartment shall measure approximately 48" wide by 38" tall by 23" deep.

The L-3 rear left side compartment shall measure approximately 38" wide by 64" tall by 23" deep.

Right Side:

The R-1 right side compartment behind the cab shall measure approximately 34" wide by 64" tall by 23" deep.

The R-2 over the wheel right side compartment shall measure approximately 48" wide by 38" tall by 23" deep.

The R-3 rear right side compartment shall measure approximately 38" wide by 64" tall by 23" deep.

The RR-1 rear tailboard compartment shall measure approximately 45" wide by 32" tall. This compartment shall be open to both side rear compartments.

GRAB RAILS

Hand rails of 1-1/4" diameter aluminum extrusion with anti-slip rubber grip inserts, shall be mounted on the apparatus.

One (1) shall be mounted near the top of the passenger side front bulkhead.

One (1) vertical handrail not less than 29" long shall be located on each side on the rear compartment of the apparatus.

One (1) full width horizontal handrail shall be provided below the hose bed at the rear of the apparatus.

HOSE BED DIVIDER

There shall be one (1) D.A. sanded aluminum hose bed divider provided and mounted per fire department instructions. Unistrut shall be installed in the hose bed so to allow the hose bed divider to be adjustable.

FOLDING STEPS

There shall be NFPA compliant folding step supplied and installed on the rear of the body for access to the roof area of the apparatus.

HARD SUCTION HOSE STORAGE

There shall be two (2) hard suction hose troughs constructed from aluminum and painted job color. The troughs shall be installed on top of the driver side compartments.

To secure hard suction hose while in transit there shall be Velcro straps installed to retain the hard suction hose in the troughs and allow for easy deployment.

LADDER STORAGE

Storage for the extension ladder shall be provided and installed in the hosebed on the passenger side or other suitable area. A nylon strap shall be provided at the rear for retaining the ladder in the trough.

ADJUSTABLE SHELF HARDWARE

There shall be five (5) sets of aluminum unistrut adjustable shelf tracking installed to vertically support the adjustable shelves. The locations shall be determined by the Fire Department.

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 two hundred fifty (250) pounds.

All shelves are to be of 3/16" smooth aluminum with press formed flanges of 2" on all four sides and have D.A. sanded finish.

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

There shall be five (5) adjustable shelves mounted on unistrut as per fire department instruction.

SLIDEOUT TOOL BOARD

All slide out tool boards shall have the capability of lateral adjustments by using P-1000 aluminum unistrut, 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 two hundred and fifty (250) pounds, even when fully extended.

All tool boards are to be of 3/16" smooth aluminum with .203 diameter holes in a pegboard pattern with 1" centers between holes. The tool board shall have 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.

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

There shall be one (1) slide out tool board installed in compartment L-3 rear left side compartment.

HEAVY DUTY SLIDE OUT TRAY

There shall be two (2) heavy-duty slide trays installed in a specified compartment. The tray locations shall be in compartment L-1 left side front compartment and in compartment R-1 right side front compartment.

All trays are to be of 3/16" 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 500 lbs. of distributed weight.

COMPARTMENT FLOOR SCUFFPLATE

There shall be an aluminum treadplate scuff plate provided on the floor of the L-1 left side front compartment and R-1 right side front compartment.

The edges of the treadplate shall be completely caulked before installation to prevent corrosion.

STOKES / BACKBOARD STORAGE

There shall be provisions made in the upper section of the rear transverse compartment for a bolt in backboard storage bin. The storage bin shall be 24" high x 5" wide x 72" long and shall allow room for backboard storage.

A strap shall be provided on each side to prevent side-to-side movement of the backboards. The backboards shall be accessible from the driver or passenger side of the apparatus.

The storage bin shall be painted to match the compartment interior.

SCBA STORAGE IN WHEEL WELL

There shall be three (3) SCBA cylinder storage compartments recessed in the corner of wheel well. There shall be two (2) on the passenger side and one (1) on the driver side of the apparatus.

The compartment door shall be a Cast products latchable-brushed aluminum type.

PUMP (HALE)

Pump shall be Hale and of a size and design to mount on the chassis rails of commercial and custom truck chassis, and have the capacity of 750-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 and related parts shall be of fine grain alloy cast iron, with a minimum tensile strength of 30,000 PSI. All moving parts in contact with water shall be of high quality bronze or stainless steel. Pump utilizing castings made of lower tensile strength cast iron not acceptable.

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

Pump shaft to be rigidly supported by two bearings for minimum deflection. The bearings shall be heavy-duty, roller or ball bearings in the gearbox and they shall be splash lubricated.

Mechanical seal only required on the inboard side of the pump. The mechanical seal must be two (2) inches in diameter and shall be spring loaded, maintenance free and self-adjusting. Mechanical seal construction shall be a carbon-sealing ring, stainless steel coil spring, and a tungsten carbide seat.

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.

The pump shaft shall be heat-treated, electric furnace, corrosion resistant stainless steel; Pump shaft must be sealed with double-lip oil seal to keep road dirt and water out of gearbox.

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 and be equipped with an air shift system to select between road and pump when pump is split driveline mounted.

All gears shall be precision ground and of the highest quality electric furnace chrome nickel steel. Bores shall be ground to size and teeth integrated and hardened to give an extremely accurate gear for long life, smooth, and higher load carrying capability.

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

For automatic transmissions, three green warning lights shall be provided to indicate to the operator when the pump has completed the shift from Road to Pump position. Two green lights to be located in the truck driving compartment and one green light on the pump operator's panel adjacent to the throttle control.

CERTIFICATION

The pump will meet and perform the following test and certification stating, the same shall be issued.

100% of rated capacity @ 150# net pump pressure
100% of rated capacity @ 165# net pump pressure
70% of rated capacity @ 200# net pump pressure
50% of rated capacity @ 250# net pump pressure

PRIMING PUMP

The priming pump shall be a positive displacement 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.

MOUNTING

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

AUXILIARY 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 of water circulating through the engine cooling system. This cooling shall be done without mixing engine and pump water.

PLUMBING

Pump plumbing shall utilize a stainless steel manifold system. Discharges and auxiliary inlets shall be plumbed using these manifold systems. Any plumbing connections shall have flexibility to prevent undue stress to the plumbing systems. Victaulic or rubber couplings shall be used where necessary to allow flexing of plumbing, which will prevent damage or loosening of piping. High-pressure hose, rated for the fire industry along with stainless steel connections shall be utilized where necessary.

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

VALVES

All intake and discharge shall be Akron Brass 8000 series heavy-duty style with stainless steel ball. The valves shall be 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.

STEAMER INLETS

A 5" steamer inlet shall be provided on the left side and right side pump panel. They shall have NST threads and terminate with a screen and long handled chrome cap.

MASTER DRAIN

Master drain that will have the capacity to drain all lines and main pump at the same time. The master drain will be mounted under the running board on the left side of the vehicle for ease of operation.

PANEL CONSTRUCTION

The Gauge panel shall be constructed of brushed stainless steel.

The upper portion of operators panel will be formed to extend upward and have stainless steel hood returning forward, thus forming an illumination hood for panel lights. Under this hood there will be two (2) halogen lights with switch located at the top pump panel.

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 the stainless 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 Class One Captain Pressure Governor will be supplied on the pump panel. The unit shall regulate the engine speed to maintain a steady pump pressure regardless of the flow rate. Operation shall be changeable from pressure mode to RPM mode and back again if desired while

pumping without any pressure variation using the MODE button. Pressure or RPM setting shall be varied using the INCREASE and the DECREASE buttons. A PRESET button allows a preprogrammed pressure or RPM to be set quickly. This preprogrammed Pressure or RPM setting shall be stored in the memory even with the power off. An IDLE button allows for quick shutdown after each operation. EFC shall bring the engine to idle in the event of pump cavitations. It shall resume **operation automatically** once water is available to the pump again.

The Captain shall display the pump Discharge and intake pressure. It shall display pressure in psi up to 600 psi. The Intake pressure display window shall also display the control setting each time a setting is changed; the engine RPM shall be displayed in 10-RPM increments. The visual alarm is not cancelable while the audio alarm shall be cancelable using the SILENCE button. All warnings shall reset automatically when the problems are corrected.

There shall be a 4-1/2" Class one gauge supplied for the master intake and discharge.

A Class One 2-1/2 compound pressure gauge shall be supplied 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.

The engine oil pressure, engine water temperature, tachometer, audible and visual warning devices shall be performed by an all in one instrument panel.

A Class One "All In One" instrument panel shall be installed on the pump panel with in easy access of the operator. The All in one module shall eliminate the use of multiple gauges, alarms and warnings to simplify the pump operator's panel. The unit provides a large display for the engine RPM, battery voltage, and display engine oil pressure and coolant temperature. Plus provides visual and external audible warning such as, horn or a bell to identify any monitored failure. Unit also, accumulates and displays engine hours, pump operating hours and incident times.

The throttle and pump in gear indicator will also be installed in the center of the pump operator's panel.

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

One (1) -30 x 600 PSI chrome 4 -1/2 main pressure gauge.

One (1) -30 x 600 PSI chrome 4 -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) Class One Enfo III instrument panel

One (1) Class One Captain Pressure Governor

One (1) Intelli Tank 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.

Relief valve control.

Primer control

U.L. test plug panel.

LABELS

Each control and gauge will be clearly marked by a color-coded nameplate, permanently affixed to the operator's 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.

PUMP WARRANTY

The pump manufacturer shall provide a two (2) year warranty.

PUMP MANUALS

Two (2) pump manuals shall be supplied from the pump manufacturer. The manuals shall cover pump operations, maintenance and parts.

CROSSLAY HOSE BED COVER (Treadplate)

There shall be an aluminum treadplate hosebed cover installed over the crosslays hose beds. Cover shall open by use of a full-length continuous stainless steel hinge installed at the front of the hose beds. Provisions shall make to prevent the lid from contacting the cab and marring the paint when in its open position.

PUMP MODULE

Due to trying to keep the overall size of the vehicle to a minimum, the size of the pump, and pump house panels must be of important consideration. The entire pump and pump module must be located in front of the body compartments and cannot exceed 36" in overall width.

The pump module shall be a self-supported structure mounted independently from the body and chassis cab. The design shall allow normal frame deflection without imposing stress on the pump module structure of side running boards. The pump module shall be a welded framework utilizing structural components properly braced to withstand the rigors of chassis frame flex. The pump module shall be bolted to the frame rails at four points.

Aluminum tread plate running boards shall be installed along both sides of the pump house to provide access to the operator's panel. Running boards shall be separate from the pump house and not be an integral part of a compartment. They shall maintain at least a 1/2 clearance from pump hose. Each step shall be rigidly braced and supported.

TANK TO PUMP

The tank to pump valve shall be a 3" inline Akron Brass 8000 series 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) 1.5" inline Akron Brass 8000 series valve shall be supplied off the discharge side of pump and be plumbed into the front head of the tank using high pressure hose. Controls shall be provided on the operator's panel.

LEFT SIDE DISCHARGE

There shall be one (1) quarter turn; Akron Brass 8000 series discharge valve shall be provided behind the left side pump panel. Control for discharge valve shall be provided on operators pump panel.

The discharge 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, Sub ZII compound gauge.

DISCHARGE OUTLET

There shall be one (1) discharge outlet piped to the front of the hose bed and located on the driver side.

The valve shall be a quarter turn 2.5" Akron Brass 8000 series discharge valve provided behind the pump panel forward in the pump house toward the cab. Control for discharge valve shall be provided on operators pump panel.

The discharge 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, Sub ZII compound gauge.

RIGHT SIDE DISCHARGE

There shall be a quarter turn 2.5" Akron Brass 8000 series discharge valve shall be provided behind the pump panel rearward in the pump house toward the body. Control for discharge valve shall be provided on operators pump panel.

The discharge 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, Sub ZII compound gauge.

1.50" TRASH LINE

There shall be a 1.5" discharge outlet furnished at the front of the apparatus. The discharge shall be piped to the center on top of the front bumper extension. Outlet shall be gated with an Akron Brass 8000 series valve.

The front discharge shall be plumbed with 2" pipe and terminate with a 1.5 NST swivel. Controls for discharge shall be located at the operator's panel. The discharge is to have a 2.5" Class 1, SUB ZII compound gauge provided at pump operators panel.

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 extruded 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, 2" Hale Torrent stainless steel valves and high pressure reinforced hose. Controls for the crosslay shall be provided at the operator's panel. A 2.5" Class 1, Sub ZII gauge shall be supplied for each crosslay.

SUCTION RELIEF VALVE

This unit shall be equipped with an Elkhart model 40-relief valve. The NFPA 1901 compliant valve will be adjustable from 75-250 PSI and will be mounted on the suction side of the pump. The valve body will be of bronze material. Adjustments are made on the valve.

AUXILIARY SUCTIONS

One (1) 2.5" auxiliary suction Akron Brass 8000 valve with chrome female swivels and NST threads shall be provided and be mounted on left side pump panel.

One (1) 2.5" auxiliary suction with 2.5" Hale Torrent Stainless steel quarter turn ball valve, and chrome female swivels with NST threads shall be provided and be mounted on right side pump panel. Controls shall be provided on the operators pump panel.

CAFS FOAM SYSTEM

The apparatus drive engine output, fire pump output, and air compressor output shall be designed to meet the criteria of CAFS performance required by applicable NFPA standards and the end user. The apparatus manufacturer shall specify these requirements before the installation of system components. Final performance of this requirement is to be verified by the end user.

The following specification defines a fully integrated Compressed Air Foam System (CAFS) to be installed on the mid-ship fire pump within the fire apparatus. Discharges to be piped as CAF discharge and/or foam solution discharge capable include the following:

(3) 1-¾ inch (44.5 mm) Pre-connected Hoses.

COMPONENTS

The major CAFS components shall include:

- A) Rotary Air Compressor (assembled to fire pump transmission)
- B) Electronically controlled Rotary Gear Pump, Discharge-Side Foam-Concentrate Proportioning System
- C) Foam Injection Check Valves (installed in stainless manifold)
- D) Foam Concentrate and Water Reservoirs (supplied by installer)
- E) Stainless Steel discharge manifold for water, foam solution, and CAFS.
- F) X-Type Motionless Mixing Chambers
- G) Stainless Steel Discharge Piping Check valves (installed)
- H) SCFM Air Flowmeter with integrated hourmeter & temperature warnings.
- I) Push-button, automatic CAFS Operating Controls

AIR COMPRESSOR

The air compressor shall be of the rotary type rated at producing a flow of a minimum of 100 standard cubic feet per minute of compressed air at 125 PSIG (8.5 BAR).

The air compressor shall have a continuous duty rating of 150 PSIG (10 BAR). Rotary Compressors with a continuous duty rating under 150 PSIG (10 BAR) are not acceptable.

Components to be included with the air compressor and to be factory installed and tested include: 1) An oil reservoir separator, 2) an air filter, 3) an oil filter and 4) a water to oil heat exchanger.

An oil temperature read-out to show the temperature in the oil reservoir separator shall be integrated with the display on the apparatus pump panel.

A built-in electronic alarm shall warn of excessive operation temperatures.

An automatic air system "blow down" valve will be installed in the system to relieve pressure in the oil reservoir separator and air compressor when the unit is shut down.

A manual over-ride control shall provide for fixed pressure operation to run rescue tools (without CAFS) from an auxiliary port, or to over-ride electrical controls in event of a mal-function.

The heat exchanger shall be capable of cooling the compressor oil at all expected operating conditions and temperatures. The heat exchanger shall be capable of 500 psig (34.5 BAR) test pressures on the water side to comply with NFPA standards, and 250 psig (17.2 BAR) on the air side. The oil cooler assembly shall be mounted on the pump and tested at the manufacturers facility.

FOAM CONCENTRATE PROPORTIONING SYSTEM

A 12 Volt DC Powered Variable Speed Rotary Gear Pump Direct Injection Foam Concentrate Proportioning System shall be integrated into the CAF System to provide foam concentrate proportioning. The system shall operate via a paddlewheel flow transducer in the discharge manifold, providing a signal to a Control Unit.

The Control Unit Microprocessor shall monitor total water flow and foam concentrate pump output providing the operator the set proportional amount of foam concentrate injection into the foam manifold.

Total foam pump concentrate output shall be 2.1 gallons per minute minimum.

The control unit display shall provide concentrate injection readout in tenths of percentage while also being able to read water flow, total water flowed and total amount of foam concentrate used. The control shall flash a warning indicating low concentrate in the reservoir to the operator, and shall be able to shut off the concentrate pump to prevent damage to the pump.

A bar graph on the control unit will provide visual indication of system operating capacity and will indicate when capacity is exceeded.

Micro Processor shall automatically change concentrate injection percentage when operators switch tanks.

In-line, field serviceable foam concentrate strainer(s) shall be installed in the foam concentrate suction line(s).

Full flow ball valves will be installed in an accessible location to permit foam tank shutdown and service of this strainer.

The strainer screen shall be of reusable stainless steel mesh.

Foam concentrate Proportioning Systems that use a Venturi (either directly or indirectly) to measure water flow, and therefore, cause a restriction to that flow, will not be accepted.

FOAM INJECTION CHECK VALVE

The foam concentrate pump discharge line shall be equipped with a bubble tight check valve, rated at 500 PSIG (34 BAR) and 10 GPM (38 LPM), to prevent water flow into the concentrate pump from the apparatus fire pump. This valve shall have a cracking pressure of 4- 6 PSIG (0.3-0.4 BAR) to prevent flowing concentrate through the pump due to head pressure from the concentrate reservoir.

The foam injection check valve shall have an integral injection fitting.

Valve shall be brass or 300 Series stainless steel with an elastomeric seat compatible with fire fighting foam chemicals (No exceptions).

FOAM RESERVOIR

An installer supplied foam reservoir conforming to NFPA standards shall be incorporated into the apparatus water tank with a separate fill tower and with 1-inch NPT minimum size bottom outlet(s). The reservoir shall hold a volume of concentrate that ensures compliance with NFPA requirements.

A cover with vacuum breaker will be provided on top of the fill tower.

A ¼ inch (6.4 mm) mesh screen shall be incorporated into the fill tower to prevent debris from entering the tank.

A low-level sensor switch will be mounted in the tank to provide a feedback signal to the foam proportioner system electronic control. The sensor signal will indicate when the foam tank is running low and will shut down the foam concentrate pump if the tank is not refilled. The switch shall be located so that false alarms do not occur and there is (1) minute reserve capacity when switch trips.

WATER RESERVOIR

An installer supplied water reservoir (booster tank) will be provided on the apparatus and will be constructed in accordance with the requirements of NFPA.

The water reservoir will have a fill connection provided as described in paragraph 6 regarding valves.

CAFS PIPING

All water, air and foam concentrate piping and hoses within the CAF System shall meet NFPA standards.

Hoses shall be compatible with oil, air and water at all maximum working pressures and maximum expected temperatures.

Air piping and valves shall be adequate to carry air at the rated SCFM (SLPM) capacities. Foam solution and CAFS pipe work shall be 300 series stainless steel or brass construction.

MIXING CHAMBERS

Four stage stainless steel static mixing chambers shall be installed on the discharge of CAFS System. These mixing chambers will consist of modular stainless steel cast sections utilizing integrally cast "fins" for semi-directional motionless agitation of the foam solution and air flow, creating a CAFS discharge. Additional four stage static mixers are required on the 3" deck gun after the discharge valve.

DISCHARGE PIPING CHECK VALVES

Check valves shall be installed on all foam equipped discharge manifolds to prevent foam solution from entering the fire pump.

Check valves shall also be installed upstream of any compressed air injection device. These check valves shall be of compact double door design and shall be constructed of stainless steel.

The check valve doors shall be spring loaded, normally closed, by means of one or more heavy-duty stainless steel torsional springs.

Flow from the fire pump shall cause the doors to open and upon pump or discharge line shutdown, the torsion spring will shut the doors.

Seating shall be resilient and water tight.

Under no circumstances will center guide, tilting disc, swing or globe check valves be accepted.

FOAM SOLUTION TO AIR RATIO CONTROL

Changing the foam consistency from wet to dry on the airflow display shall automatically increase the % foam when running below 1%. This will allow one button switching from Wet to Dry foam types.

Foam Injection % may also be adjusted independently of Air Injection. Foam solution to Air Ratio Control shall be incorporated in the CAFS discharge plumbing. This control shall be automatically regulated by the panel digital control to maintain air/foam solution ratios, and allow the pump operators to select foam consistencies from “wet” to “dry”.

No single or multiple manual lever actuators will be accepted.

The foam solution to air ratio control shall also be the compressed air injection point common for all the compressed air foam discharges.

One panel-mounted operator control shall be provided for foam consistency control of all the CAFS discharges.

The foam solution to Air Ratio Controls shall be designed to not shut the water flow off even under an error or failure condition.

The entire CAFS manifold system shall flow 750 gpm of water or foam solution.

A digital readout flow meter showing standard cubic feet per minute (SCFM) or normal cubic meters per hour (NCMH) will be installed to read gross CAF System air output (actual flow) of the rotary air compressor.

The display shall be mounted on the pump operator’s panel. The air flow meter sensor shall automatically compensate for temperature and pressure and read directly in SCFM (NCMH).

Flow meters that do not automatically compensate for temperature and pressure will not be accepted.

CAFS OPERATING CONTROLS

All CAFS operating controls (foam concentrate proportioning system control, digital water and air flow meters) shall be mounted and integrated as part of the main apparatus pump panel. Under no circumstances will auxiliary control panels be permitted. Under no circumstances will an “auxiliary” module type CAFS package be installed on the apparatus.

No auxiliary drive engines will be permitted for the CAFS installation. Compressor, Foam Proportioner and CAFS controls shall be engaged and enabled when pump is placed in “pumping gear”.

CAFS shall be available by opening the discharge valve for the specific CAFS equipped discharge.

CAFS and or Foam solution may be turned off independently at the control panel. Compressor can be disengaged at the control panel.

A liquid filled Duplex Master Gauge shall be installed on the pump panel showing fire pump discharge and CAF System air discharge pressures.

A red needle for air and a black needle for water pressure shall operate on a common gauge face.

Safety enhancement features incorporated into the CAF System shall include a control valve in the outlet of the CAF System. This valve shall close and prevent airflow when a transducer monitoring the output of the foam concentrate pump reads no foam pump output, or if no water is flowing, or if the foam tank is empty. This feature shall prevent the injection of air when foam concentrate is not being injected, thus preventing “slug-flow” conditions.

Safety placards shall be installed upon the apparatus providing warnings against the use of the compressed air source for SCBA or any other breathing apparatus.

Warning placard should also warn against using hose caps because of the possibility of residual compressed air in hose lines and within the apparatus piping, that potentially could propel caps and other objects causing personal injury.

THERMAL PROTECTION DEVICE

The pump shall be equipped with a thermal protection device, which monitors the pump water temperature, and relieves water when the temperature exceeds 120° F (49° C). This device shall have an indicator lamp on the pump operator panel to show when the device is open.

There must also be a test button located on the panel adjacent to the lamp.

AUTO-FILL

The apparatus shall be equipped with a 2.5” “AutoFill” automatic tank fill valve. The AutoFill valve shall automatically fill the booster tank without pump operator intervention, when supplied with an adequate water supply source. The system shall include a “Auto / Manual” switch on the pump panel and be integrated with the Class 1 booster tank water level gauge also located on the pump panel.

POLY TANK

The tank shall have a capacity of 250 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 tank shall be "T" shaped and shall be constructed of 1/2" thick polypropylene sheet stock. This material shall be a no 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 1 safety factor to facilitate easy removability. 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.

FILL TOWER AND COVER

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 by the purchaser in Special Provisions. The tower shall have a 1/4" thick removable polypropylene screen and a 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 40 polypropylene pipe with a minimum I.D. of 4" that is designed to run through the tank, and shall be piped behind the rear wheels where specified by the purchaser in Special Provisions so as to maximize traction.

The tank cover shall be constructed of 1/2" thick 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 1/2-13 to accommodate the lifting eyes.

SUMP

There shall be one (1) sump standard per tank. The sump shall be constructed of 1/2" 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 pipes 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 ant swirl 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 must meet all NFPA 1900 guidelines in effect at the time of manufacture.

MOUNTING

The tank 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 must be isolated from the cross members through the use of hard rubber strips with a minimum thickness and width dimension of 1/4" Additionally, the tank must be supported around the entire bottom outside perimeter and captured both 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.

FOAM CELL

The foam tank shall be an integral part of the water tank. The cell shall have a capacity of 30-gallons minimum for class foam.

The foam cell shall reduce the capacity of the water tank. The foam cell shall have a screen in the fill dome and a breather in the lid.

There shall be a foam tank drain of 1" with the drain valve located inside the pump compartment accessible through a door on the passenger side pump panel.

WATER LEVEL INDICATOR

An electronic water level gauge shall be provided on the operators panel that registers water level by means of five (5) color coded LED lights. The lights shall be durable ultra bright LED design viewable through 180-degrees.

The water level indicators shall be as follows.

100% = Green

75% = Yellow

50% = Yellow

25% = Yellow

Refill = Red

The Red light will flash when the level drops below the given indicator to provide an eight (1/8) of a tank indication. To further alert the pump operator all the lights will flash sequentially when the water tank is empty.

The level measurements shall be based on the measuring of head pressure of the fluid in the tank. An industrial pressure transducer shall be mounted to the outside of the tank. The field calibrated display measures head pressure to accurately show the tank level.

FOAM LEVEL GAUGE

An electronic foam level gauge shall be provided on the operator's panel that registers foam level by means of five (5) color coded LED lights. The lights shall be durable ultra bright LED design viewable through 180-degrees.

The foam level indicators shall be as follows.

100% = Green
75% = Yellow
50% = Yellow
25% = Yellow
Refill = Red

The Red light will flash when the level drops below the given indicator to provide an eighth (1/8) of a tank indication. To further alert the pump operator all the lights will flash sequentially when the foam tank is empty.

The level measurements shall be based on the measuring of head pressure of the fluid in the tank. An industrial pressure transducer shall be mounted to the outside of the tank. The field calibrated display measures head pressure to accurately show the tank level.

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 be 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 grommited 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 DIAGNOSTICS

The system shall incorporate a feature that enables a service representative to troubleshoot, repair and replace nodes in the system, should they for any reason fail. It will be run via a PC interface and will monitor all system information. All messages going across the communications bus must be seen on the screen, including analog information. Each node must be capable of being queried for its own voltage drop and capable of obtaining the status of all inputs and outputs from the diagnostics interface.

The system shall feature the following:

- Total load management
- Load shedding capabilities (will begin load shedding when voltage drops below selected level after a 2-minute period per output.)
- Load sequencing capabilities
- PC Diagnostics
- Error reporting
- Continuous system monitoring and reporting

PC PROGRAMMING

The system must be programmable at the factory in a language that can be downloaded to a remote 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.

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 to understand diagnostic procedures; failure detection; 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.

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/Backup/Turn Lights (Whelen L.E.D. 600 Series)
STOP / TAIL / TURN / BACKUP LIGHTS

Body shall be equipped with stop, tail, and 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 Whelen brand 600 series 4" x 6" L.E.D lights installed in cast aluminum housings mounted to the rear of the apparatus. The back up light shall remain halogen white.

CLEARANCE / MARKER LIGHTS (L.E.D)

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

BACKUP ALARM

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

STEP LIGHTS

There shall be four (4) step lights provided. One (1) step light shall be provided on each side; on the front compartment face and two (2) step lights shall be provided to illuminate the rear tailboard.

LED COMPARTMENT LIGHTS

The body compartments shall be equipped with low voltage, light emitting diode (LED) strip style lighting. Each light strip shall consist of a single LED placed every 1.5" in a durable and impact resistant lexan 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 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 two (2) 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) 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 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.

BATTERY CONDITIONER AIR PUMP

There shall be a Kussmaul Auto Charge Pump Plus Super kit 091-9-1000-S-KIT installed on the chassis. It shall consist of an Auto Charge 1000 120 volt AC battery conditioner with a Super 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 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 on the cab. A 10 element LED charge indicator shall be mounted on the driver's side of the cab near the shoreline inlet.

The shoreline inlet is a Kussmaul Super Auto-Eject input connector with a weather proof, sealed box and 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.

The Kussmaul Pump Plus air compressor shall be located in the front left body compartment (room permitting). Or in a location agreed upon by the Fire Department.

The Super eject and bar graph shall be installed on the driver side pump panel.

SHORELINE AUTO EJECT

There shall be one (1) shoreline receptacle provided to operate the dedicated 120-volt circuits on the truck without the use of the generator. The shoreline shall be provided with a NEMA 5-20, 120-volt 20-amp straight blade Kussmaul auto eject plug with yellow spring loaded weatherproof cover to prevent water from entering when the shoreline is not connected.

The auto eject wired to the vehicles starting system is energized when the engine is started. This instantaneously ejects the plug from the receptacle.

A mating connector shall be supplied with the completed unit.

SPOTLIGHT

There shall be a Sho-Me 300,000 CP hand held spot light be hard wired installed in the cab of the chassis.

LIGHT BAR

A Whelen model FN60QLED NFPA LED 60" light bar shall be installed on the cab roof of the unit. There unit shall contain a total of two (2) front corner linear 12's, four (4) front linear 8's, two (2) red and two (2) white, and two (2) end red linear 8's.

LOWER ZONE WARNING LIGHTS

A Whelen NFPA 1901 lower zone warning light package shall be installed on the unit.

LOWER ZONE A WARNING LIGHTS (GRILL)

There shall be four (4) 60R00FR 600 series L.E.D. surface mount lights mounted on the unit. Two (2) lights shall be mounted to the grill on the front of the chassis with chrome flanges. The lens color shall be red.

Two (2) shall be mounted on the cab fender panels one (1) on each side with chrome flanges. The lens color shall be red.

Flash Pattern shall be determined by the fire department.

LOWER ZONE B&D WARNING LIGHTS

There shall be a total of six (6) 60R00FRR 600 series L.E.D. surface mount lights mounted on the unit. There shall be three (3) red 600 series L.E.D lights with mounted on each side in the lower half of the unit (zones B & D lower). One light shall be located at the front, another shall be midship, and the third shall be toward the rear of the apparatus. Cast aluminum housings shall be used in those locations where flush mounting is not available.

ADDITIONAL LOWER ZONE C WARNING LIGHTS

There shall be a two (2) PowerArc model L.E.D210-R red, sweep lights mounted on the rear of the unit (zone C lower).

LOWER ZONE C WARNING LIGHTS

There shall be two (2) 60R00FR 700 series L.E.D. surface mount lights mounted on the rear of the unit. The lights shall be surface mounted by use of the 6E flange on the rear lower half of the unit (zone C lower). The lens color shall be red.

Flash pattern shall be determined by the fire department.

UPPER ZONE WARNING LIGHTS

A Whelen NFPA 1901 L.E.D. upper zone warning light package shall be installed on the unit.

There shall be a total of four (4) 90R00FRR 900 series L.E.D. and two (2) 70R00FRR surface mount lights mounted on the unit. Each light shall be equipped with a chrome flange. Lights shall be mounted as follows:

There shall be two (2) red lights mounted on each side in the upper half of the body (zones B & D upper) There shall be two (2) red LED rotating beacons mounted on the rear upper half of the unit (zone C upper)

TRAFFIC ADVISOR

There shall be a Whelen model TA837L, 39" traffic advisor with a TACTRL1A control head installed on the upper rear of the apparatus.

The advisor shall contain L.E.D lights with amber lenses with arrow lenses on either end of the bar. The advisor has the capability to direct traffic to the right or to the left or the right and left simultaneously. The control head shall be mounted in the cab convenient to the driver.

ELECTRONIC SIREN

There shall be one (1) Whelen model 295HFSA1 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 recessed in the front chassis bumper symmetrically balanced in the front.

SCENE LIGHTS

The unit shall be equipped with four (4) Whelen 508 series surface mount 8-32 degree halogen lights. The four (4) lights shall be mounted per fire department request.

SCENE LIGHTS

There shall be two (2) Unity hose bed deck lights, 6" diameter with 50-watt halogen bulb in chrome house installed on the rear.

120 VOLT & 240 VOLTS

Since the apparatus is 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 bodywork 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

The generator system shall be a 6 KW Hydraulic installed by the apparatus manufacturer. The generator shall be mounted in the dunnage area above the pump house.

BREAKER BOX

The main breaker box shall be a Square D with twelve (12) circuit breaker rated to wire size and load demand. The circuit breaker panel shall be equipped with standard circuit breakers. Circuit breaker panel shall be installed on the front (left) wall of compartment over the rear wheels. An engraved label shall be furnished next to breaker box to indicate switches and circuits.

PAIN

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, doorjamb 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 contaminants 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 topcoat.

The apparatus body shall then be painted with a minimum of three (3) coats of high luster final finish polyurethane paint.

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 topcoat finish.

The body shall be painted to match the (PAINT COLOR & CODE) supplied by the fire department.

COMPARTMENT INTERIOR PAINT

The compartment interiors shall be painted with gray spatter type paint.

LETTERING

There shall be a maximum of sixty (60) 3" tall 3M reflective gold letters applied to the apparatus. The lettering shall also have left drop shading applied. The exact location of the lettering shall be supplied by the department.

STRIPE

There shall be a 4" Ruby Red Scotchlite reflective band provided across the front of the vehicle and along both sides of the body. There shall be one (1) "Z" shaped jog provided in the reflective stripe design. A 4" Ruby Red band shall be provided across the rear of the apparatus.

CAB DOOR INTERIOR REFLECTIVE STRIPE

There shall be a 6" x 16" Ruby Red reflective stripe provided across the interior of each cab door. The stripes shall be located approximately 1" up from the bottom of the door on a stainless steel door scuff panel.

911- DECALS

There shall be a set of two (2) Ruby Red insert reflective lettering "DIAL 911" supplied and installed per Fire Department.

The reflective stripe shall stop and "DIAL 911" shall be placed within the break of the stripe.

"DIAL" shall be vertical and as tall as the stripe. The "911" shall be horizontal and be as tall as the stripe.

LADDER

There shall be one (1) Duo-Safety 12' two section aluminum extension ladder series 1000-A supplied with the unit.

HARD SUCTION HOSE

There shall be two (2) 5" x 10' section of PVC flexible hard suction hose with NST threads provided with the completed unit. The brand shall be Task Force PVC.

BARREL STRAINER

There shall be one (1) barrel strainer with a chrome finish and 5" NST threads.

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

A service manual shall be provided with the completed unit. Manual shall include equipment and component information as well as warranty and service information.