



E-ONE APPARATUS PROPOSAL


DATE: June 21, 2023

This Proposal has been prepared for:
Alachua County Public Works
5620 NW 120th Lane
Gainesville, FL 32653


Hall-Mark RTC. is pleased to offer Alachua County Public Works one (1) 2024 E-ONE 3000-gallon tanker on an International chassis to be custom built and equipped in accordance with the requirements of Alachua County Public Works Department to the attached truck list. This unit is quoted using the Tallahassee Contract #3740A. The purchase price shall include all vehicle components and NFPA equipment as requested by the fire department as detailed in the Hall-Mark Proposal. Delivery will be F.O.B. customer location and will be made approximately 200 calendar days after receipt of chassis. Terms of payment shall be cash on delivery (COD) when unit arrives at Alachua County Public Works Department.

E-ONE VM8 3000 GALLON TANKER - 74228	\$ 288,558.00
Customer changes	<u>\$ 153903.00</u>
Total	\$ 442,461.30

This quote is valid until July 30, 2023.


Chris Beville - Account Manager
725 SW 46th Avenue, Ocala, FL 34474 (352) 304-7362

6-21-23
Date


Dee Daniels - Director of Sales
725 SW 46th Avenue, Ocala, FL 34474 (352) 629-6305

6-21-23
Date

Q 126141 Rev 4

Customer: ALACHUA CO.

VM8 BASE MODEL

TANKER SIDE MOUNT 3000 GALLON

VM8 Compliance

NFPA 1901 COMPLIANT

Unit will be manufactured and tested to current NFPA guidelines.

E-ONE Badging

The following logos shall be provided:

(4) small E-ONE logos mounted one each side and rear

(1) vinyl logo on the front bumper

VM8 CHASSIS OPTIONS

Isolated Air Reservoir

The air system shall have an additional 1738 cu. in. isolated reservoir. The supply side of the reservoir shall be equipped with a check valve and an 85 psi pressure protection valve.

Specified options shall be plumbed to the isolated air tank.

CAB COLOR

The cab shall be painted by the OEM. One solid color - FLNA 3225 E-ONE RED

ENGINE COOLER

An engine cooler shall be supplied on the commercial chassis as provided by the commercial chassis supplier.

STEEL WHEELS PAINTED JOB COLOR

Chassis steel wheels will be painted job color from the OEM.

WHEEL TRIM KIT

The front wheels shall have stainless steel lug nut covers (for use with aluminum wheels) or chrome plated plastic (for use with steel wheels). The front axle shall be covered with American made Real Wheels brand mirror finish, 304L grade, non-corrosive stainless steel universal baby moons. All stainless steel baby moons shall carry a lifetime warranty plus a 2 year re-buffing policy. There shall be two (2) baby moons and twenty (20) lug nut covers.

The rear wheels shall have stainless steel lug nut covers (chrome plated steel lug nut covers not acceptable), or American made chrome plated plastic lug nut covers. The rear axle shall be covered with American made Real Wheels brand mirror finish, 304L grade, non-corrosive stainless steel, spring clip band mount high hats, DOT user friendly. All stainless steel high hats shall carry a lifetime warranty plus a 2 year rebuffing policy.

ENGINE

Cummins L9 360HP engine. 360HP @2200 RPM, 1150 lb-ft torque @ 1200 RPM, 2200 RPM Governed Speed, 359 Peak HP

DRIVER CONTROLLED DIFFERENTIAL

A driver controlled main differential lock shall be supplied in forward rear and rear reaxl axle. Operated from within the cab, it reduces wheel spin-outs by transferring power from the slipping wheel to the wheel with traction. An indicator shall be provided visible to the driver to show when the lock is engaged.

INTERNATIONAL 2 DOOR CAB AND CHASSIS

International HV607 Conventional – 2023

Minimum GVWR: 2-door – 60,000 lbs

Maximum 60 MPH road speed limit (per NFPA 1901)

Side of hood air intake with NFPA compliant ember screen and fire retardant Donaldson or equal air cleaner.

Minimum 325 amp alternator

Batteries: (3) 12-volt 1980 CCA total maintenance free with threaded studs mounted left side under cab

Battery disconnect switch cab mounted. Disconnects power to power distribution center. Indicator warning light with green ON indicator light mounted on left side of dash instrument panel.

Turbocharged 18.7 cfm air compressor with internal safety valve and mechanical governor

Exhaust brake integral with variable geometry turbo. With ON/OFF dash switch. Must automatically activate apparatus stop lamps.

Right side outboard under step mounted horizontal aftertreatment system with horizontal tailpipe exiting forward of right rear wheels

Engine aftertreatment device, automatic over the road active regeneration and dash mounted single regeneration request/inhibit switch

Diesel exhaust fluid tank – 5 gallon under left cab aft of fuel tank with bright aluminum overlay

Horton Drivemaster ON/OFF fan direct drive, two-speed with residual torque device.

1045 square inch louvered aluminum radiator with 373 sq.in. CAC and tank oil cooler.

Electric grid air intake warmer

TRANSMISSION

Allison 3000 EVS automatic

PTO provision for Chelsea 280 series PTO (2)

Vocation package 198 for fire vehicle applications

Magnetic drain plugs

Push-button electronic shift control – dash mounted

Water-to-oil cooler in radiator tank

Synthetic fluid

FRONT AXLE

16,000 lb. wide track I-beam type

16.5X6 Q-PLUS cast spider heavy duty cam front brakes, double anchor, fabricated shoes

Fire and Emergency Severe Service, non-asbestos front lining

Cast iron front brake drums

Front oil seals

Vented oil front hub caps with window, center and side plugs

Automatic slack adjusters with stainless steel clevis pins

Power steering

2-quart see-through power steering reservoir

Minimum 16,000 lb. taperleaf suspension

Maintenance-free rubber bushings

Shock absorbers

REAR AXLE

Meritor RT-46-164EH 46,000 lb. tandem

5.38 rear axle ratio

Iron carrier with standard axle housing

Extended lube main driveline with half-round yoke

16.5X7 Q-plus air S-cam type rear brakes, double anchor, cast shoes

Fire and Emergency Severe Service non-asbestos rear brake linings

Brake cams and chambers on forward side of drive axle

Rear oil seals

Brake chambers – front: 20 sq.in long stroke; rear: 30/30 sq. in. long stroke with spring actuated parking brake

Automatic slack adjusters

BRAKE SYSTEM

WABCO 4S/4M ABS

Air Compressor: 18.7 cfm

Air system pressure protection and 85 psi pressure protection for air horns

Relay valve with 5-8 psi crack pressure

Air Dryer - Bendix AD-9 with heater

Auto Drain valve – wet tank

FUEL TANK & SYSTEM

Minimum 50 gallons/189 liter rectangular polished aluminum mounted beneath left front cab door.

Bright aluminum treadplate trim package will be installed beneath the cab doors above the secondary step and the bottom of the cab and the first and secondary step.

Fuel/water separator with water in fuel sensor with heater

High temperature reinforced nylon fuel line

Fuel cooler

TIRES & WHEELS

Front: 315/80R22.5 Load Range L HAU 3 WT Continental with 22.5x9 hub piloted steel disc wheels

Rear: 11R22.5 Load Range H HDR2 Continental with 22.8.25 hub piloted steel disc wheels.

CAB EXTERIOR

Air cab mounting

Cab roof reinforcements for roof mounted lightbar

Left and right interior grab handles and exterior non-slip grab handles

Chromed grille

Chromed air intake grille with ember screen

Fiberglass tilting hood

Dual 25 inch round Hadley hood mounted air horns (one left and one right) with shields.

Left and right air horn foot switches with momentary dash switch for horn button

Door locks and ignition switch keyed alike

Dual Aero pedestal mirrors; chrome; heated; left and right remote adjustment 8 inch bright finish convex mounted under primary mirrors

Aftertreatment system on right side with polished diamond plate cover

Tinted windshield and door glass

Manual door window regulators

Contoured chromed steel (delete if extended SST bumper is selected as option)

Front tow hooks – frame mounted (2)

CAB INTERIOR

Molded inner door panels

Gray vinyl interior

Black mats with single insulation

Heater, defroster and air conditioner with standard HVAC ducts and controls with recirculation switch

Premium cab insulation

Door activated dome lights, forward left and right and (if 4-door) rear left, right and center.

Manual cab door locks

Seats:

- Driver: Seats, Inc 911 Universal Series high back vinyl air suspension driver seat with NFPA 1901 compliant seat sensor
- Officer: Seats, Inc 911 Universal Series high back vinyl air suspension passenger seat with NFPA 1901 compliant seat sensor

NFPA compliant high visibility red seatbelts

All seating positions shall have a seat sensor that advises the driver through a visual display on the dash within the driver zone of seatbelt status for all positions in the apparatus. The sensors shall be connected directly to the VDR (vehicle data recorder (VDR) integrated into the dash. Connection for downloading recorded data shall be through the J1939 port.

Adjustable tilt and telescoping steering column with 4-spoke 18 inch steering wheel

Driver and officer side interior sunvisors

INSTRUMENTS & CONTROLS

Engine remote interface with park brake interlock

Low air pressure indicator light and audible alarm

2 inch primary and secondary air pressure gauges

Engine compartment mounted air restriction indicator with graduations and warning light in dash

Woodgrain driver and center instrument panel

Electronic cruise control with switches in left switch panel

Ignition switch with non-removable key

Heavy duty onboard diagnostics interface connector located below left dash

2 inch fuel gauge

Engine remote interface for remote throttle

Engine remote interface connector in engine compartment

Engine coolant temperature gauge

Engine oil pressure gauge

2 inch transmission temperature gauge

Engine and trip hour meters integral within driver display

Electronic stability control

Power and ground wiring provision in overhead console

Electronic MPH speedometer with secondary KPH scale without odometer

Vehicle speed sensor

Electronic 3000 rpm tachometer

Digital voltage display integral in driver display

Electric windshield wiper motor and display

Alternating flashing headlamp system with fire apparatus controlled engagement

Parking brake system with dash valve control auto/neutral and warning indicator

Self-cancelling turn signal switch with dimmer, washer/wiper and hazard in handle

CAB DOOR RETRO-REFLECTIVE STRIPING

Chevron style retro-reflective striping will be added to the inside of the cab doors in accordance to NFPA requirements. It will cover not less than 96 sq.in of each door meeting MFPA 1901.

TIRE PRESSURE MONITORING SYSTEM

There will be a RealWheels LED AirGuard Set and Go, six (6) wheel stabilizer kit, for 2.00 inch round holes and LED indicators proper air pressure in the tire.

The inner tire on the rear dual axle will have an extension provided that will pass through the outside rim and attach to the stabilizer providing an unobstructed view for inspection of the inner tire air pressure.

The indicators will be installed by the department after the unit has been fully equipped and the tires set to the manufactures recommended pressure rating. The indicators will calibrate to that initial air pressure setting upon installation and will intermittently flash when the tire pressure is reduced by 5 to 10 psi from its original calibrated pressure.

AIR OUTLET

A ¼" male plug air hose inlet will be connected to the air reservoir tank. A ¼" inline check valve will be installed in the line. Air hose connection will provide the capability of filling the air brake system with air from an outside source. It will be located beneath the driver's cab door above the fuel tank.

Jacobs Engine Brake

One (1) Jacobs engine brake shall be installed to assist in slowing and controlling the vehicle as required by NFPA 1901 for vehicles with gross vehicle weight ratings (GVWR) of 36,000 lbs. or greater. An on-off control switch and a high-medium-low selector switch shall be mounted in the cab accessible to the driver.

When activated, the Jacobs engine brake shall cut off the flow of fuel to the cylinders and alter the timing of the exhaust valves. This shall transform the engine into a high-pressure air compressor, driven by the wheels, and the horsepower absorbed by the engine in this mode shall slow the vehicle. The selector switch allows the driver to select the amount of retarding power.

When the on-off switch is in the "on" position, the engine brake shall be automatically applied whenever the accelerator is in the idle position and the automatic transmission is in the lock-up mode. If the accelerator is depressed or if the on-off switch is placed in the "off" position, the engine brake shall immediately release and allow the engine to return to its normal function.

VM8 PUMP MODULE OPTIONS

Auxiliary Air Tank Plumbing

The auxiliary air tank shall be plumbed to air primer.

Running Board Tray Securing Strap [Qty: 2]

A heavy duty black nylon strap with an stainless steel quick-release buckle shall be provided for the running board hose tray(s). The strap shall be attached to the inboard side of the tray as low as practical to allow cinching of strap for securing tray contents and shall not reduce the overall tray capacity.

AUXILIARY ENGINE COOLER

The auxiliary engine cooler shall be controlled from the pump operator's panel by an Innovative Controls 1/4 turn valve with "T" handle. The 1/4 turn handle grip shall feature built-in color-coding label and a verbiage tag.

1/2" lines shall be installed from the pump discharge via the valve to the cooler and back to the pump intake to allow a small amount of water to circulate through the engine cooler.

CROSSLAY PRECONNECTIONS

Two (2) crosslay hosebeds shall be provided on the pump module. Each of the two (2) crosslay areas shall have a capacity for up to 200' of 2.0" double-jacket fire hose double stacked. The crosslay floor and side walls shall be constructed of 3/16" (.188) smooth aluminum plate. The floor shall be slotted to prevent the accumulation of water and allow for ventilation of wet hose. One (1) 1/4" (.25") smooth aluminum plate fixed divider with a sanded finish shall be provided to separate the two (2) hose storage areas.

The crosslay hose bed shall consist of a 2" heavy-duty hose coming from the pump discharge manifold to the 2" swivel for each hosebed. The hose shall be connected to a manually operated 2" Akron valve. The valve shall be an Akron 8800HD series with a 316 stainless steel ball and dual polymer seats for ease of operation and increased abrasion resistance. The valve shall have a self-locking ball feature using an automatic friction lock design to balance the stainless steel ball when in a throttle position with water flowing through it.

The valve shall be of the unique Akron swing-out design to allow the valve body to be removed for servicing without disassembling the plumbing.

The valve control shall be located at the pump operator's panel and shall visually indicate the position of the valve at all times.

All fabricated piping shall be a minimum of Schedule 10 stainless steel for superior corrosion resistance and decreased friction loss.

SIDE MOUNT PUMP MODULE

PUMP COMPARTMENT

The complete apparatus pump compartment will be constructed of a combination of structural tubing and formed sheet metal. The same materials used in the body will be utilized in the construction of the pump compartment. The structure will be welded utilizing the same A.W.S. Certified welding procedure as used on the structural body module. These processes will ensure the quality of structural stability of the pump compartment module.

The pump compartment module will be separated from the apparatus body with a gap. This gap is necessary to accommodate the flexing of the chassis frame rails that are encountered while the vehicle is in transit so that harmful torsional forces are not transmitted into the structural framework.

The front of the pump module will be overlaid entirely above the frame rails with bright aluminum diamond plate fastened with mechanical stainless steel fasteners.

FLEX PUMP MODULE MOUNTING SYSTEM

The entire pump module assembly will be mounted above the chassis frame rails exclusively with not less than four (4) torsion isolator assemblies to reduce the vibration and stress providing an extremely durable body mounting system.

The pump module substructure will be mounted above the frame to allow independent flexing to occur between the body and the chassis. Each assembly will be mounted to the chassis frame rails with steel, gusseted mounting brackets. Each body mount bracket will be mounted to the side chassis frame flange with 5/8" Grade 8 Geomet coated (anti-corrosion) bolts. Each mounting bracket will be bolted to the frame using not less than four (4) bolts.

There will be no welding to the chassis frame rail sides, web or flanges, or drilling of holes in the top or bottom frame flanges between axles. All pump module to chassis connections will be bolted so that in the event of an accident, the module will be easily removable from the truck chassis for repair or replacement.

Because of the constant vibration and twisting action that occurs in chassis frame rails and suspension, the torsion mounting system is required to minimize the possibility of premature pump module structural failures.

LEFT SIDE OPERATORS PANEL & PUMP PANEL

The pump operator's panel will be located on the left side of the apparatus pump compartment. The panel will be split into an upper and lower section.

The panels will be hinged minimum 14 gauge 304 stainless steel with brushed finish and thumb-release latches.

The upper panel will house gauges and controls and be hinged downward to allow easy access to mounted components. The door will have a stainless steel hinge and push button latches.

The lower panel on the left side will be hinged as described above to allow swinging the panel toward the front of the apparatus.

RIGHT SIDE PUMP PANELS STYLE

There will be two (2) pump panels on the right side of the pump compartment, one (1) upper and one (1) lower. Each panel will be accessible by a quick-release mechanical type latch, closing against a door seal. Both panels will be easily removed for access to the pump for service.

RIGHT & LEFT SIDE BRUSHED STAINLESS STEEL PANELS & OVERLAYS

The panels for the pump compartment on the left and right side will be made from minimum 14 gauge 304 stainless steel capable of withstanding the conditions and effects of extreme weather and temperature changes.

RUNNING BOARDS

The pump compartment running boards will be made of a structural tubular framework. They will be not less than 12 inches deep. The tubular frame support all loads by transmitting the loads through the pump compartment structure directly to the chassis frame rails.

The running boards will be independent of the apparatus body and will be integrated to the pump compartment structure only, eliminating any pump compartment to body interference. This is essential in keeping a truly 'modular' configuration. Slip-resistant abrasive adhesive materials will be applied to the top surface of the running board framework to provide a suitable stepping surface where applicable.

They will have a .188 inch embossed (no exceptions) aluminum diamond plate overlays installed.

PLUMBING SYSTEM - DSD 1250 GPM

MIDSHIP PUMP

The Hale DSD mid-ship pump will have the capacity of 1250 gallons per minute, measured in U.S. Gallons. The pump will be a Hale single stage.

PUMP ASSEMBLY

The entire pump will be assembled and tested at the pump manufacturer's factory. The pump will be driven by a drive line from the truck transmission. The engine will provide sufficient horsepower and RPM to enable pump to meet and exceed its rated performance.

The entire pump will be hydrostatically tested to a pressure of 600 PSI. The pump will be fully tested at the pump manufacturer's factory to the performance spots as outlined by (NFPA) 1901, Standard for Automotive Fire Apparatus. Pump will be free from objectionable pulsation and vibration.

The pump body and related parts will be of fine grain alloy cast iron, with a minimum tensile strength of 30,000 PSI (2069 bar). All metal moving parts in contact with water will be of high quality bronze or stainless steel. Pump utilizing castings made of lower tensile strength cast iron not acceptable.

Pump body will be vertically split, on a single plane for easy removal of entire impeller assembly including clearance rings.

Pump shaft to be rigidly supported by two bearings for minimum deflection. The bearings will be heavy-duty, deep groove ball bearings in the gearbox and they will be splash lubricated. Shaft seal comes standard with face-type, self-adjusting corrosion- and wear-resistant mechanical seals.

The pump impeller will be hard, fine grain bronze of the mixed flow design; accurately machines, hand-ground and individually balanced. The vanes of the impeller intake eye will be hand ground and polished to a sharp edge and be of sufficient size and design to provide ample reserve capacity utilizing minimum horsepower.

Impeller clearance rings will be bronze, easily renewable without replacing impeller or pump volute body.

The pump shaft will 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.

GEAR BOX

Pump gearbox will be of sufficient size to withstand up to 16,000 lbs. ft. of torque of the engine. The drive unit will be designed of ample capacity for lubrication reserve and to maintain the proper operating temperature.

The gearbox drive shafts will be of heat-treated chrome nickel steel and at least 2.75 inches in diameter, on both the input and output drive shafts. They will withstand the full torque of the engine.

All gears, drive and pump, will be of highest quality electric furnace chrome nickel steel. Bores will be ground to size and teeth integrated and hardened, to give an extremely accurate gear for

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

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

If the gearbox is equipped with a power shift, the shifting mechanism will be a heat treated, hard anodized aluminum power cylinder, with stainless steel shaft. An in-cab control for rapid shift will be provided that locks in road or pump.

For automatic transmissions, three green warning lights will be provided to indicate to the operator(s) 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 pump operator's panel adjacent to the throttle control. For manual transmissions, one green warning light will be provided for the driving compartment. All lights to have appropriate identification/instruction plates.

APPARATUS PLUMBING LABELING

Verbiage tag bezels will be installed for each control. The bezel assemblies will be used to identify apparatus components. These tags will be designed and manufactured to withstand the specified apparatus service environment and will be backed by a warranty equal to that of the exterior paint and finish. The verbiage tag bezel assemblies will include a chrome-plated panel-mount bezel with durable easy-to-read UV resistant polycarbonate inserts featuring the specified verbiage and color coding. These UV resistant polycarbonate verbiage and color inserts will be subsurface screen printed to eliminate the possibility of wear and protect the inks from fading. Both the insert labels and bezel will be backed with 3M permanent adhesive, which meets UL969 and NFPA standards.

PRESSURE GOVERNOR AND MONITORING DISPLAY

The pump shall be controlled by a Class 1, "TPG" Total Pressure Governor installed on the pump operator's panel. It shall be interfaced with a SAE J1939 Controller Area Network (CAN) device that controls engine speed using data communications directly to the engine ECU or with an analog control signal. Operating on the J1939 network, the governor is able to monitor engine RPM and other pertinent data directly from the engine ECU. Control algorithms shall be optimized to take advantage of the J1939 CAN data to yield crisp and accurate control of engine and subsequently pump speed and pressure output. Graphic diagnostics shall be integrated that provides wiring and troubleshooting information.

It shall control the engine fuel to maintain a desired pump pressure, or engine speed setting. Additionally the TPG will display important engine information specifically battery voltage, engine coolant temperature, oil pressure and RPM.

Features:

- A panel control module (display), a pressure transducer and appropriate cables and connectors.
- Large easy to read Alpha/numeric display.
- Sealed electronics which provide maximum resistance to water, condensation, and humidity.
- A panel display which consolidates throttle with preselect and high idle features in a single 4-1/2" weather resistant housing.
- Communicates with the engine ECU over the J1939 CAN bus for improved accuracy resolution and response. When in the "pressure" mode the TPG will operate as a pressure sensor (regulating) governor (PSG) eliminating any need for a relief valve on the discharge side of the pump. This feature will be set to operate at 100 psi unless specifically requested by the customer to use another pressure. This setting can be changed by the department.

The following parameters shall be visible at all times:

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

TESTING PORTS

Test port connections for pressure and vacuum will be provided at the pump operator's panel. One (1) will be connected to the intake side of the pump, and the other to the discharge manifold side of the pump.

Each port will have 0.25 inch (6.35 mm) standard pipe thread connection and be manufactured of non-corrosive polished stainless steel or brass plugs.

PRESSURE RELIEF VALVE

A pressure relief valve will be provided. The valve will have an easy to read adjustment range from 90 to 300 PSI with 90, 125, 150, 200, 250 and 300 PSI adjustment settings and an "OFF" position. Pressure adjustments will be made utilizing a 1/4" hex key, 9/16" socket or 14mm socket.

For corrosion resistance the cast aluminum valve will be a hardcoat anodized with a powder coat interior and exterior finish. The valve will meet (NFPA) 1901, Standard for Automotive Fire Apparatus, requirements for pump inlet relief valves. The unit will be covered by a five year warranty. The valve will be preset at 125 PSI (860 kPa) suction inlet pressure, unless otherwise shop noted. The valve will be installed inside the pump compartment where it will be easily accessible for future adjustment. The excess water will be plumbed to the atmosphere and will dump on the opposite side of the pump operator.

For normal pumping operations, the relief valve will not be capped and there will be a placard stating "DO NOT CAP" installed.

TANK LEVEL GAUGE

There will be a Class 1 model #ITL-40M blue tank level gauge provided and installed at the pump operator's panel location.

The tank level gauge will indicate the liquid level for water in increments of 1/20th of a tank with a visual warning at 1/4 of a tank.

The tank level gauge will include a pressure transducer mounted on the outside of the tank, a super bright LED display with visual indication and weather resistant connectors.

PUMP COMPARTMENT WORK LIGHT

A LED work light will be installed in the pump compartment module to illuminate the piping and plumbing components.

The light will be activated by a weather resistant toggle switch installed inside the pump compartment.

MASTER DRAIN VALVE

A Trident manifold type drain valve will be installed in the pump compartment. All pump drains will be connected to the master drain valve. The drain valve will be controlled from the left side lower pump house sill. The control will be a hand wheel knob marked "open" and "closed".

The drain will be located such that it will not interfere with pumping operations or function such as soft suction hoses, etc. nor will it protrude past the outer edge of the apparatus, to prevent damage to the valve.

In some cases, it is necessary to locate the master drain in a secondary location to ensure proper draining. If no lower or vertical sill exists, the drain will be located below the bottom outside edge of the hose body near the forward most corner on the driver's side hose body. The drain will not protrude past the outer edge of the body, thus preventing damage to the valve.

PUMP SEAL

A mechanical, or packing style seal will be supplied on the inboard side.

PUMP SHIFT

The drive unit will be provided with an air pump shift system. The control valve will be a spring loaded guard lever that locks in "Road" or "Pump" mode.

To the left of the pump shift control, there will be two indicator lights to show the position of the pump when the control is moved to "Pump" position. A green light will be energized when the pump shift has been completed and will be labeled "PUMP ENGAGED"; a second green light will be labeled "OK TO PUMP" energized when both the pump shift has been completed and the chassis automatic transmission is engaged.

A third green indicator light will be installed adjacent to the throttle on the pump operator's panel. This light will be labeled "Throttle Ready".

In addition to this indicator light, an additional indication will be provided to the pump operator at the panel when the pump is ready to pump. This additional indication will be that one (1) of the operator's panel illumination lights will only activate when the "OK TO PUMP" indicator is lit.

AIR PUMP SHIFT LOCATION

The pump shift will be mounted in the "best fit" location as determined by the apparatus manufacture.

PUMP COOLING LINE

There will be a .38 inch line running from the pump to the water tank to assist in keeping the pump water from overheating. A valve will be installed on the operator's panel.

PUMP ANODE

One (1) pump anode will be installed on the suction side of the pumping system to prevent damage from galvanic corrosion within the pump system.

DISCHARGE AND INLET MANIFOLDS

A 6.00 inch pump manifold inlet will be provided on each side of the pump. The inlets will protrude up to 2 inches (50mm) away from the side panels and maintain a low connection height. A discharge manifold will also be added to the pressure side of the pump to feed the specified discharge waterways.

The main pump inlets will have National Standard Threads and include removable screens designed to provide cathodic protection for reducing deterioration in the pump.

MAIN PUMP INLET - LEFT SIDE

A 6.00 inch pump manifold inlet will be provided on the left side of the pump. The inlet will protrude up to 2.00 inches away from the side panel and maintain a low connection height.

The main pump inlet will have National Standard Threads and includes a removable screen designed to provide cathodic protection for reducing deterioration in the pump.

MAIN PUMP INLET - RIGHT SIDE

A 6.00 inch pump manifold inlet will be provided on the right side of the pump. The inlet will protrude up to 2.00 inches away from the side panel and maintain a low connection height.

The main pump inlet will have National Standard Threads and includes a removable screen designed to provide cathodic protection for reducing deterioration in the pump.

6" CHROME PLATED BRONZE CAP

There will be one (1) 6.00 inch long handled chrome plated cap installed on each Steamer Inlet.

STAINLESS STEEL PLUMBING

All auxiliary suction and discharge plumbing related fittings, and manifolds will be fabricated with 3.00 inch (77 mm) schedule 10 stainless steel pipe; brass or high pressure flexible piping with stainless steel couplings. Galvanized components and/or iron pipe will NOT be accepted to ensure long life of the plumbing system without corrosion or deterioration of the waterway system. Where waterway transitions are critical (elbows, tees, etc.), no threaded fittings will be allowed to promote the smooth transition of water flow to minimize friction loss and turbulence. All piping components and valves will be non-painted, unless otherwise specified. All piping welds will be wire brushed and cleaned for inspection and appearance.

The high pressure flexible piping will be black SBR synthetic rubber hose with 300 PSI working pressure and 1200 PSI burst pressure for flexible piping sizes 1.50 inches (38 mm) through 4.00 inches (100 mm). Sizes .75 inch (19 mm), 1.00 inch (25 mm) and 5.00 inches (125 mm) are rated at 250 PSI working pressure and 1000 PSI burst pressure. All sizes are rated at 30 in HG vacuum. Reinforcement consists of two plies of high tensile strength tire cord for all sizes and helix wire installed in sizes 1.00 inch (25 mm) through 5.00 inches (125 mm) for maximum performance in tight bend applications. The material has a temperature rating of -40 degrees Fahrenheit to +210 degrees Fahrenheit.

The stainless steel full flow couplings are precision machined from high tensile strength stainless steel. All female couplings are brass. Mechanical grooved and male .75 inch (19 mm) and 1.00 inch (25 mm) couplings are brass. A high tensile strength stainless steel ferrule with serrations on the I.D. is utilized to assure maximum holding power when fastening couplings to hose.

PUMP HOUSE LINE PROTECTION

All drain lines for the discharges, suction, ABS discharge gauge lines and any other appropriate connections in the pump house area will have a protective cover provided on the lines in the required areas of the lines to prevent the lines from rubbing on any other components in the pump house area.

All drain lines, ABS lines, high pressure discharge lines and electrical wiring in the pump house area will be properly and neatly routed, wire tied and rubber coated "P" clamped, to keep the items secured.

DRAIN VALVES

An Innovative Controls 3/4" quarter turn drain valve will be included on each discharge, gated intake, and steamer valve (if applicable). A side stem, long stroke chrome plated lift handle will be provided on the drain valve to facilitate use with a gloved hand. The drain valve will have an ergonomically designed handle with a recessed verbiage tag area easily read by the operator before opening.

The drain valve will be connected to the valve with a flexible hose that is routed in such a manner as to assure complete drainage to below the apparatus.

VALVE CONTROL - T-HANDLE PULL ASSEMBLY

Unless specified otherwise, the discharge valves will be controlled from an Innovative Controls side mount valve control assembly. The ergonomically designed handle will be chrome-plated with recessed areas for name plate and color code. A .75 inch (19.5 mm) diameter hardcoat anodized aluminum control rod and housing will, together with a stainless spring steel locking mechanism, eliminate valve drift. Teflon impregnated bronze bushings in both ends of the rod housing will minimize rod deflection, never need lubrication, and ensure consistent long-term operation. The control assembly will include a decorative chrome-plated panel-mounting bezel. The valve operating mechanism will indicate the position of the valve at all times.

AUXILIARY LEFT SIDE INLET

There will be one (1) auxiliary gated suction inlet with .75 inch bleeder installed on the left side pump panel.

INTAKE VALVE

A 2.50 inch Akron Brass 8000 series swing-out valve with stainless steel ball.

The intake control valve will be a 'swing out type' direct operation manual lever actuator at the valve.

INTAKE PLUMBING

The plumbing will consist of 2.50 inch piping, and will incorporate a manual drain control installed below the pump area for ease of access.

SUCTION/INTAKE TERMINATION

The termination will include the following components:

One (1) 2.50 inch NST swivel female straight adapter with screen

One (1) 2.50 inch self-venting plug, secured by a chain

The inlet will be located on the pump panel.

LEFT SIDE DISCHARGE

There will be two (2) 2.50 inch gated discharges installed on the left side of the apparatus.

RIGHT SIDE DISCHARGE

There will be one (1) 2.50 and one (1) 3.00 inch gated discharges installed on the right side of the apparatus.

CROSSLAYS

There will be one (1) 2.5" crosslay located above the pump panel to the rear of the 1.5" crosslays. Removable flooring will be provided in the hose bed area for drainage.

One (1) crosslay divider located ahead of the 2.5" crosslay shall be provided. The divider shall be fabricated of .188-inch smooth aluminum and will have a sanded finish.

DISCHARGE GAUGES

A 2.50 inch gauge will be supplied for reading the pressure of each discharge greater than 1.50 inches in diameter, unless otherwise specified.

MASTER GAUGES

A 4.50 inch Master Vacuum and Master Pressure gauge will be provided and installed on a panel to the right of the crosslays (side mount) OR centered on the pump panel (top mount).

GAUGE SCALE

Each gauge will be marked for reading a pressure range of 0-400 PSI.

GAUGE FACE COLOR

Each gauge will have black markings on a white face.

BEZELS FOR 2.5" DISCHARGE GAUGES

There will be a Deluxe metal bezel supplied around each of the 2.50 inch discharge pressure gauges. The bezels will be constructed from chrome-plated zinc with large, easily identifiable recessed labels for color-coding and verbiage.

TANK TO PUMP LINE

The connection between the tank and the pump will be capable of the flow recommendations as set forth in (NFPA) 1901, Standard for Automotive Fire Apparatus, latest revision and will be tested to those standards when the pump is being certified.

One (1) non-collapsible flexible hose and valve will be incorporated into the tank to pump plumbing to allow movement in the line as the chassis flexes to avoid damage during normal road operation. Four (4) inch stainless steel schedule 10 piping will be used to complete the connection from the tank to pump valve to the water tank.

TANK TO PUMP CHECK VALVE

There will be a tank to pump check valve, conforming to NFPA standard requirements to prevent water from back flowing at an excessive rate if the pump is being supplied from a pressurized source. The check valve will be mounted as an integral part of the pump suction extension. A hole up to .25 inch is allowable in the check valve to release steam or other pressure buildup so that the void between the valve and check valve may drain of water that could be subject to freezing.

TANK FILL LINE

One (1) 2.00 inch tank fill/recirculating line will be installed from the pump directly to the booster tank.

A 3.00 inch Akron Brass 8000 series swing-out valve with a stainless steel ball.

The valve will be controlled from the pump operator's panel location.

PUMP PANEL LIGHTS

There will be adequate illumination provided at the side pump panels with the installation of shielded LED light assemblies, one (1) on the left and one (1) on the right side pump compartment.

One (1) pump panel light at the operator's panel will be illuminated at the time the pump is ready to pump and it is "OK TO PUMP". The Pump shift has been completed and the chassis automatic transmission is engaged.

The remaining lights will be controlled by a switch located on the side operator's panel.

RUNNING BOARD SUCTION TRAYS - EACH SIDE

A running board suction hose tray approximately 10" D (9" to the slats) x maximum width available of the pump module shall be provided in the left and right side running board.

The tray shall be recessed mounted and constructed of 1/8" (.125) aluminum diamond plate (exterior) with a smoother surface interior. The tray shall be designed to store a minimum 15' length of soft suction hose. The bottom of the tray shall have removable turtle tile and drain holes to allow water drainage from hose stored in the tray.

REAR DIRECT TANK FILL

A 3" rear direct water tank fill shall be provided. The tank fill shall be located driver side rear of the tank.

The tank fill shall be controlled at the valve. The valve shall be constructed of brass and shall be slow closing per NFPA. The tank fill connection shall include a strainer, 3" chrome NST swivel, chrome plug and retainer device.

Trident Primer

A Trident air operated priming system shall be installed in place of standard primer. The unit shall be of all brass and stainless steel construction and designed for fire pumps of 1,250 GPM (4,600 LPM) or more. Due to corrosion exposure no aluminum or vanes shall be used in the primer design. The primer shall be three-barrel design with 3/4" NPT connection to the fire pump.

The primer shall be mounted above the pump impeller so that the priming line will automatically drain back to the pump. The primer shall also automatically drain when the panel control actuator is not in operation. The inlet side of the primer shall include a brass "wye" type strainer with removable stainless steel fine mesh strainer to prevent entry of debris into the primer body.

The system shall create vacuum by using air from the chassis air brake system through a two-barrel multi-stage internal "venturi nozzles" within the primer body. The noise level during operation of the primer shall not exceed 75 Db.

Air Flow Requirements

The primer shall require a minimum of 15.6 cubic foot per minute air compressor and shall be capable of meeting drafting requirements at high idle engine speed. The air supply shall be from a chassis supplied "protected" air storage tank with a pressure protection valve. The air supply line shall have a pressure protection valve set between 70 to 80 PSIG.

Primer Control

The primer control shall have a manually operated, panel mounted “push to prime” air valve. The valve shall direct air pressure from the air brake storage tank to the primer body. To prevent freezing, no water shall flow to and from the panel control.

Warranty

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

VM8 BODY OPTIONS

REAR RUBRAIL

The lowest edge of the rear tailboard will be trimmed with an extruded C-Channel aluminum extrusion rub rail not less than 3” high x 1.50” deep. Each end of each rail will be capped with a contoured black formed PVC end cap for safety matching the shape of the rub rail.

The inside flat surface will be designed to apply retro-reflective striping for added visibility and rear clearance lights.

The rub rail will be secured with stainless steel fasteners and spaced away from the apparatus body with .50 inch nylon spacers to help absorb moderate impacts and prevent the collection of water and debris for easier cleaning.

HOSEBED DIVIDER ADDITIONAL [Qty: 2]

There shall be an additional hose bed divider provided the full fore-aft length of the hose bed.

The hose bed divider shall be constructed of 1/4” (0.25”) smooth aluminum plate with an extruded aluminum base welded to the bottom. The rear end of the divider shall have a 3” radius corner to protect personnel. The divider shall be natural finish aluminum for long-lasting appearance and shall be sanded and de-burred to prevent damage to the hose.

The divider shall be adjustable from side to side in the hose bed to accommodate varying hose loads.

ADJUSTABLE SHELF [Qty: 5]

Compartment shelving (each) shall be provided as required by the customer. The shelving will be made out of .190 inch smooth aluminum sheet material with a formed 2.00 inch lip on the front and back.

Side mounting brackets will be provided for vertical adjustment.

SLIDE MASTER TRAY [Qty: 2]

A SlideMaster roll out tray (each) shall be floor mount in the compartment as specified by the customer.

Each tray will feature all-aluminum structural rails to prevent corrosion. The rails shall be rated at a minimum of 700 lbs. capacity. A push-pull lever will be provided to release the tray from lock in or lock out position using rotary latch. The aluminum tray shall have 70% extension. The tray shall be fabricated of minimum .125 inch thick aluminum sheet material with four (4) 3.00 inch side flanges, corner welded for maximum strength and will be as wide and as deep as compartment allows.

HOSEBED DIVIDER

There will be a full height adjustable divider provided and installed in the hosebed area of the apparatus body.

The divider will be fabricated of .25 inch thick aluminum plate and attached to the adjustable slide rails. The rear of the divider will have a radius to provide a smooth corner.

Hose payout will be unobstructed by the divider.

DUAL SCBA COMPARTMENTS

Dual SCBA storage compartments shall be installed in the wheelskirt panels, (2) each side, that will accommodate 8.00 inch diameter x 24.00 inch long spare SCBA bottles, one (1) each fore and aft on the left and right side.

The compartments will be vacuum formed PVC material with a drain hole at the bottom rear. A hinged stainless steel door will be provided over the opening with a thumb-release latch.

Each compartment will hold two (2) SCBA bottle for a total of eight (8) spare bottles.

Hose allowance

Hose allowance: 800 lbs.

Equipment allowance

Equipment allowance: 1000 lbs.

SWIVEL REAR DUMP

A tank dump valve shall be provided at the rear of the body.

The tank dump shall be a Newton Kwik Swivel Dump and shall include a 10" x 10" flip-up valve plate for maximum water flow. The lower portion of the dump assembly shall swivel 180

degrees and shall include a manual chute extension that shall extend the dumping past the sides of the body and rear tailboard area.

The dump valve shall be manually actuated from the upper area of the dump assembly and shall be accessible from the driver or officer side during side to side dumping operations.

The exterior surface of the dump assembly shall be stainless steel.

FOLD-A-TANK COVER - PAINTED

The fold-a-tank cover shall be painted the primary job color.

ROLL UP DOORS

There will be a total of four (4) roll-up doors for compartments L-1, L-2, R-1, R-2 . Each compartment will have a non-locking ROM Series IV roll-up shutter door.

Each shutter slat, track, bottom rail, and drip rail will be constructed from anodized 6063 T6 aluminum. Shutter slats will feature a double wall extrusion with a concave interior surface to minimize loose equipment jamming the shutter door closed. Shutter slats will feature an interlocking end shoe to prevent side to side binding of the shutter door during operation. Slat must have interlocking joints with an inverted locking flange. Slat inner seal will be a one piece PVC extrusion; seal design will be such to prevent metal to metal contact while minimizing dirt and water from entering the compartment.

Shutter door track will be one piece design with integral overlapping flange to provide a clean finished look without the need of caulk. Door track will feature an extruded rubber double lip low profile side seal with a silicone co-extruded back to reduce friction during shutter operation.

Shutter bottom rail will be a one piece double wall extrusion with integrated finger pull. Finger pull will be curved upward with a linear striated surface to improve operator grip while operating the shutter door. Bottom rail will have a smooth contoured interior surface to prevent loose equipment from jamming the shutter door. Bottom rail seal will be a double "V" seal to prevent water and debris from entering compartment. Bottom rail lift bar will be a one piece "D" shaped aluminum extrusion with linear striations to improve operator grip during operation. Lift bar will have a wall thickness of 0.125 inches. Lift bar will be supported by no less than two pivot blocks; pivot blocks will be constructed from Type 66 Glass filled reinforced nylon for superior strength. Bottom rail end blocks will have incorporated drain holes which will allow any moisture that collects inside the extrusion to drain out.

Shutter door will have an enclosed counter balance system. Counter balance system will be 4.00 inches in diameter and held in place by 2 heavy duty 18 gauge zinc plated plates. Counter balance system will have 2 over-molded rubber guide wheels to provide a smooth transition from vertical track to counter balance system.

The compartment doors will have a satin aluminum finish.

Each roll up door will have an integral door open indicator magnet in the lift bar.

If the door is not properly closed and the transmission is placed into drive or reverse mode with the parking brake released, it will activate the “hazard light” in the cab to alert the crew.

Brushed stainless steel sill plates will be installed at the bottom of each body compartment door opening.

HOSEBED / CROSSLAY COVERS

HOSEBED

The hosebed area will have a vinyl cover installed on the top and rear of the hosebed area.

The top cover will be held in place by an extrusion installed across the front edge of the hosebed and Velcro along the left and right edges. The top rear of the hosebed cover will be secured each side by a footman's loop and buckles allowing for the cover to be pulled tight on each side. Additional footman's loops will be provided each side at the lower corners at the floor of the hosebed to secure the cover to the apparatus.

The full cover will have a flap with Velcro closure providing access to each fill tower without necessitating removal of entire hosebed cover.

CROSSLAY

The crosslay hose bed area will have a vinyl cover installed on the top and each side of the crosslay area.

The top cover will be held in place with velcro. The sides of the crosslay cover will be secured by means of two footman's loops and buckles, each side. The footman's loops will be installed at the lower corners to secure the cover to the apparatus.

The hosebed and crosslay covers will be Red color.

HARD SUCTION STORAGE [Qty: 2]

Hard suction hose storage shall be provided on the driver side of the body in an adjustable rack.

The storage rack shall be constructed of aluminum plate and include buckle type hold downs.

The storage rack shall be capable of storing one (1) 6” x 10’ hard suction hose each.

WATER TANK

TANK CAPACITY

A water tank will be installed with a minimum capacity of 3000 US gallons.

TANK CONSTRUCTION

The booster tank will be constructed of .50 inch thick Polypropylene sheet stock which is a non-corrosive stress relieved thermoplastic. It will be designed to be completely independent of the body and compartments. All joints and seams are extrusion welded and/or contain the "Bent Edge" and tested for maximum strength and integrity. The top of the tank is fitted with lifting eyes designed with a 3 to 1 safety factor to facilitate tank removal.

COVER

The tank cover will be constructed of .50 inch thick Polypropylene and will be recessed. A minimum of two lifting dowels will be drilled and tapped .50 inch x 2.00 inch to accommodate the lifting eyes. The cover will include an integral hosebed.

BAFFLES

The swash partitions will be manufactured from .50 inch Polypropylene. All partitions will be equipped with vent and air holes to permit movement of air and water between compartments to provide maximum water flow. All swash partitions interlock and are welded to one another as well as to the walls of the tank.

MOUNTING

The tank will be isolated from the body substructure cross members with .3125 inch x 2.50 inch rubber strips that are 60 durometer in hardness. The tank will sit nested inside the center body substructure and will be completely removable without disturbing the body side panels. Tank stops on all four sides and tank tie downs will keep the tank from shifting front to back or side to side.

FILL TOWER

The fill tower opening will be approximately 13.00 inches x 13.00 inches.

The tower will have a .25 inch thick removable Polypropylene screen and a Polypropylene hinged type cover that will open if the tank is filled at an excess rate. There will be a removable .25 inch (6.40 mm) thick Polypropylene screen to prevent debris from falling into the tank.

The fill tower will have a 6.00 inch overflow that will discharge underneath the tank, behind the rear axle(s), avoiding the chassis fuel tank and suspension components where applicable. The overflow will terminate above the tank water level when filled to the rated capacity.

The fill tower will be located to the right side at the front of the hose bed

SUMP

The sump will be constructed in an 8.00 inch x 14.00 inch x 1.00 inch deep area.

The construction material will utilize .50 inch Polyprene and be located in line with the tank suction valve.

SUMP PLUG

The sump will have a 3.00 inch plug for use in draining and cleaning out the tank.

OUTLETS

In addition to the tank suction valve outlet , there will be an outlet provided for the tank fill valve. If there are any additional options selected (such as direct tank inlets), there will be additional outlets provided to accommodate these items.

APPARATUS BODY

BODY MATERIAL TYPE

At a minimum, all formed substructure crossmembers and associated assemblies, exterior panels and compartments will be emergency vehicle industry standard 5052-H32 aluminum alloy. Softer alloys will not be acceptable in the construction processes, except where non-structural bright aluminum treadplate is utilized. The subframe shall be constructed of 3/16" (.188") aluminum plate with cross beams constructed of 1/4" (.25") aluminum plate across the wheel wells and front of the body. The body side panels and compartments shall be constructed of a minimum 1/8" (.125") aluminum plate.

FASTENERS

All fasteners utilized on the substructure crossmembers, associated assemblies and body compartment structures will be precision engineered Huck® fasteners.

Once installed, no matter how vibration-intensive the environment, these fasteners are engineered to never come loose. Huck bolts are to provide direct metal-to-metal contact when installed, to eliminate the transverse vibration often found in conventional nuts and bolts that have a tendency to loosen over time.

ANTI-CORROSION PROCESS

Absolutely no dissimilar metals will be used in the body and its supporting substructure without being separated by ECK®. This process is not required where the fastener is an aluminum Huck-bolt to aluminum components.

BODY FINITE ELEMENT ANALYSIS

The proposed body design must have completed a review and analysis. Analysis to cover both static and dynamic situations must be completed. The purpose of the finite element analysis is to ensure proper design of the apparatus body, and that it is capable of carrying the typical fire apparatus loads and those specified by NFPA for equipment. The analysis process must conclude that the body structure is properly designed and manufactured to provide longevity under normal conditions.

BODY MOUNTING SYSTEM

The entire body module assembly will be mounted above the chassis frame rails exclusively with not less than twelve (12) torsion isolator assemblies to reduce the vibration and stress providing an extremely durable body mounting system.

The body substructure will be mounted above the frame to allow independent flexing to occur between the body and the chassis. Each assembly will be mounted to the chassis frame rails with steel, gusseted mounting brackets. Each body mount bracket will be mounted to the side chassis frame flange with .625" (5/8") Grade 8 Geomet coated (anti-corrosion) bolts. Each mounting bracket will be bolted to the frame using not less than four (4) bolts.

There will be no welding to the chassis frame rail sides, web or flanges, or drilling of holes in the top or bottom frame flanges between axles. All body to chassis connections will be bolted so that in the event of an accident, the body will be easily removable from the truck chassis for repair or replacement.

Because of the constant vibration and twisting action that occurs in chassis frame rails and suspension, the torsion mounting system is required to minimize the possibility of premature body structural failures.

Compartment Interior Walls

All compartment interiors will be smooth aluminum plate.

Compartment Floors

All body compartment floors will be smooth aluminum plate and have a .75" (3/4") lip downward at the door opening side of the compartment. This lip will form a "sweep-out" compartment. The design will also allow for a complete door / weather seal across the bottom.

Each compartment will have the ability to drain and louvers ventilation adequate to provide air circulation.

EXTERIOR COMPARTMENT LOCATIONS AND CONFIGURATION

L-1 - Left Side Forward

There will be one (1) a compartment ahead of the rear wheels on the left side of the apparatus.

The approximate interior dimensions of this compartment will be 60"W x 37.5"H x 26"D.

The approximate pass-thru opening will measure 57.5"W x 27.5"H.

L-2 - Left Side Rear of Wheels

There will be a compartment aft of the rear wheels on the left side of the apparatus.

The approximate interior dimensions of this compartment will be 28"W x 37.50"H x 26"D.

The approximate pass-thru opening will measure 25.5"W x 27.5"H.

R-1 - Right Side Forward

There will be one (1) a compartment ahead of the rear wheels on the right side of the apparatus.

The approximate interior dimensions of this compartment will be 60"W x 37.5"H x 26"D.

The approximate pass-thru opening will measure 57.5"W x 27.5"H.

.R-2 - Right Side Rear of Wheels

There will be a compartment aft of the rear wheels on the left side of the apparatus.

The approximate interior dimensions of this compartment will be 28"W x 37.50"H x 26"D.

The approximate pass-thru opening will measure 25.5"W x 27.5"H.

COMPARTMENT UNISTRUT

Vertically mounted Unistrut will be installed in all apparatus body compartments to accommodate the installation of shelves, trays, and or other miscellaneous equipment.

HOSEBED

The hosebed will be a UPF integral hosebed, integral to the water tank.

CORNER TRIM – STAINLESS STEEL

The front and rear of the apparatus body and tank vertical wall overlay will be integrated with a minimum .625" (5/8") satin finish stainless steel corner trim for edge protection. The vertical edge trim will extend from the top to bottom and will be attached with stainless steel fasteners.

REAR TAILBOARD

The tailboard will be an independent assembly bolted to the rear body structural framing to provide body protection and a solid rear stepping platform.

The rear tailboard and body will be constructed such that the angle of departure will be not less than eight (8) degrees at the rear of the apparatus when fully loaded (NFPA) 1901, Standard for Automotive Fire Apparatus.

The rear tailboard will be approximately not less than 9.5"D x full width of the body. The step surface will be formed bright treadplate aluminum with an embossed aggressive anti-slip pattern.

Three (3) LED rear body marker lights will be centered on the face of the step.

On the rear body surface, a sign will be attached that states: "DO NOT RIDE ON REAR STEP, DEATH OR SERIOUS INJURY MAY RESULT."

WHEEL WELLS

Wheel wells will have semicircular black polymer composite inner liners that are bolted to the wheel well panel. Each wheel well will be a continuous piece with no breaks or ledges where road grime or debris may accumulate. This liner will be removable for access to suspension assembly for repairs. There will be no exception to the bolted wheel well inner liner requirement.

SIDE RUB RAILS

The lowest edge of the apparatus body side compartments will be trimmed with an extruded C-Channel aluminum extrusion rub rail not less than 3"H x 1.50"D. Each end of each rail will be capped with a contoured black formed PVC end cap for safety matching the shape of the rub rail. The rub rails will not be constructed as an integral part of the apparatus body structure, allowing each rub rail to be easily removed in the event of damage.

The inside flat surface will be designed to apply retro-reflective striping for added visibility, clearance lights, auxiliary turn signal and NFPA 1901 Lower Zone warning lights.

The rub rails will be secured with stainless steel fasteners and spaced away from the apparatus body with .5" (1/2") inch nylon spacers to help absorb moderate side impacts and prevent the collection of water and debris for easier cleaning.

ADJUSTABLE RACK

Adjustable tracking shall be provided on the both the left and right side of the apparatus.

The tracking shall be positioned above the compartment top and shall allow for maximum adjustment of items mounted to the tracks.

REAR LADDER

A ladder shall be provided at the officer / right side rear to access the top of the apparatus body. The ladder shall be constructed with .375" (3/8") aluminum plate side rails and 1.25" (1-1/4") diameter extruded ribbed aluminum steps. The ladder shall be designed with a slight inward taper to facilitate easier climbing. LED lighting shall be provided to illuminate the ladder steps per NFPA.

HANDRAILS

Two (2) handrails will be installed on the rear of the apparatus. Each handrail will be of an adequate length, as available usable space allows, to provide a suitable gripping area for personnel.

One (1) vertical handrail will be installed, driver / left side, just below the hose bed sides. The remaining handrail will be installed officer / right side vertically on the hosebed side.

TOW EYES

There will be two rear tow eyes installed to the frame rails, one each side, accessible below the rear of the apparatus. They will be manufactured of 1" plate steel 5" wide with a 2.5" round hole.

Each plate will be bolted to the chassis frame rail with minimum .625" (5/8") Grade 8 Geomet coated (anti-corrosion) bolts. All steel components will be painted black.

MUD FLAPS

Heavy-duty black rubber mud flaps will be provided behind the rear wheels. The mud flaps will be bolted in place.

PORTABLE TANK STORAGE RACK

A Zico QUIC-LIFT Portable Tank System (PTS) rack shall be provided. The rack shall lower a portable tank from the stored position to provide a safe and convenient height for unloading and loading.

The rack shall be hydraulically operated by two (2) durable high cycle 12 volt actuators and controlled by a 30 amp two-pole double-throw momentary switch located at the officer side rear body area. The control switch location shall allow the operator to monitor operations, monitor positioning of apparatus mounted equipment in the storage racks travel path and ground personnel while lowering and raising the rack.

The storage rack shall be self-locking in any position during operation. A visual signal shall be provided to indicate when the storage rack is in motion by two (2) yellow flashing lights installed one (1) on each side of the rack.

The rack shall also be wired through the door ajar indicator light located in the cab to alert the driver that the rack is not stowed if the parking brake is released.

The storage rack shall be capable of storing a maximum of three hundred pounds (300 lbs).

The rack shall be located to the officer side of the body and shall be capable of storing a 3500 gallon aluminum frame tank.

Rubber Fenderettes

Rubber fenderettes shall be provided two each side at the body wheelwell. The rubber fenderette shall extend 2.75" out from the mounting point.

VM8 WARNING LIGHTS

WHELEN LIGHT BAR

A Whelen Justice JE2NFPA 56" LT BAR shall be provided. The light bar will be mounted on brackets forward facing above the cab roof.

The light bar shall meet the requirements for Upper Zone A.

EMERGENCY WARNING SYSTEM

Upper Zone B, C, & D:

There will be a Whelen model R316 red Rotator with clear lens installed on the upper left and right rear body for a total of two (2).

Lower Zone A:

There will be two (2) red Whelen 600 series Super-LED lights (model 60R02FCR) with chrome bezels and clear lenses installed and installed on the grille of the apparatus chassis.

Lower Zone B&D:

There will be four (4) Whelen ION-TLIR Super-LED lights with chrome bezels and clear lenses installed in the lower rubrails: two (2) each side forward and two (2) each side aft.

Lower Zone C:

There will be two (2) red Whelen 600 series Super-LED lights (model 60R02FCR) with chrome bezels and clear lenses installed in the lower section of the taillight assembly.

Siren Control Head

One (1) Whelen electronic siren, model #295SLSA1 will be provided and mounted in the top of the cab console.

The siren will be 100-200 watts and feature wail, yelp, phaser, air horn and manual wail. The microphone will have noise canceling circuitry and Public Address override.

The siren and hard wired microphone will be installed within reach of the driver and officer.

Siren Speaker

A Federal Signal model ES100 100 watt siren speaker will be provided, located on the front bumper face on the left side outboard of the frame rail in the far outboard position.

Back Up Alarm

An electronic back-up alarm will be supplied. The 97 dB alarm will be wired into the chassis back-up lights to signal when the vehicle is in reverse gear.

Rear View Camera

There will be a shielded camera mounted up high at the rear of the vehicle to provide a wide angle rear view with audio.

A minimum 5.6" color monitor will be mounted on cab console with swivel capability.

The camera will be interlocked with the chassis transmission. When the apparatus is placed in reverse the camera will automatically be activated and when the transmission is placed in any other gear the screen will return to the previously displayed screen.

VM8 12V ELECTRICAL

BROW LIGHT

A FireTech 46" long brow flood light with white housing shall be installed beneath the lightbar over the cab roof. The flood light will be 18,000 lumens with split optics

The brow light will be activated by separate switches located on the cab console, scene, spot and flood.

ELECTRICAL SYSTEM - VMUX

Electrical System

The apparatus shall incorporate a Weldon V-MUX multiplex 12 volt electrical system. The system shall have the capability of delivering multiple signals via a CAN bus. The electrical system installed by the apparatus manufacturer shall conform to current SAE standards, the latest FMVSS standards, and the requirements of the applicable NFPA 1901 standards.

The electrical system shall be pre-wired for optional computer modem accessibility to allow service personnel to easily plug in a modem to allow remote diagnostics.

The electrical circuits shall be provided with low voltage over-current protective devices. Such devices shall be accessible and located in required terminal connection locations or weather-resistant enclosures. The over-current protection shall be suitable for electrical equipment and shall be automatic reset type and meet SAE standards. All electrical equipment, switches, relays, terminals, and connectors shall have a direct current rating of 125 percent of maximum current for which the circuit is protected. The system shall have electro-magnetic interference suppression provided as required in applicable SAE standards.

Any electrical junction or terminal boxes shall be weather-resistant and located away from water spray conditions.

Multiplex System

For superior system integrity, the networked multiplex system shall meet the following minimum component requirements:

- The network system must be Peer to Peer technology based on RS485 protocol. No one module shall hold the programming for other modules. One or two modules on a network referred to as Peer to Peer, while the rest of the network consists of a one master and several slaves is not considered Peer to Peer for this application.
- Modules shall be IP67 rated to handle the extreme operating environment found in the fire service industry.
- All modules shall be solid state circuitry utilizing MOS-FET technology and utilize Deutsch series input/output connectors.
- Each module that controls a device shall hold its own configuration program.
- Each module should be able to function as a standalone module. No “add-on” module will be acceptable to achieve this form of operation.
- Load shedding power management (8 levels).
- Switch input capability for chassis functions.
- Responsible for lighting device activation.
- Self-contained diagnostic indicators.
- Wire harness needed to interface electrical devices with multiplex modules.
- The grounds from each device should return to main ground trunk in each sub harness by the use of ultrasonic splices.

Wiring

All harnessing, wiring and connectors shall be manufactured to the following standards/guidelines. No exceptions.

- NFPA 1901-Standard for Automotive Fire Apparatus
- SAE J1127 and J1127

- IPC/WHMA-A-620 – Requirements and Acceptance for Cable and Wire Harness Assemblies. (Class 3 – High Performance Electronic Products)

All wiring shall be copper or copper alloys of a gauge rated to carry 125 of the maximum current for which the circuit is protected. Insulated wire and cable 8 gauge and smaller shall be SXL, GXL, or TXL per SAE J1128. Conductors 6 gauge and larger shall be SXL or SGT per SAE J1127.

All wiring shall be colored coded and imprinted with the circuits function. Minimum height of imprinted characters shall not be less than .082” plus or minus .01”. The imprinted characters shall repeat at a distance not greater than 3”.

A coil of wire shall be provided behind electrical appliances to allow them to be pulled away from mounting area for inspection and service work.

Wiring Protection

The overall covering of the conductors shall be loom or braid.

Braid style wiring covers shall be constructed using a woven PVC-coated nylon multifilament braiding yarn. The yarn shall have a diameter of no less than .04” and a tensile strength of 22 lbs. The yarn shall have a service temperature rating of -65 F to 194 F. The braid shall consist of 24 strands of yarn with 21 black and 3 yellow. The yellow shall be oriented the same and be next to each other.

Wiring loom shall be flame retardant black nylon. The loom shall have a service temperature of -40 F to 300 F and be secured to the wire bundle with adhesive-backed vinyl tape.

Wiring Connectors

All connectors shall be Deutsch series unless a different series of connector is needed to mate to a supplier’s component. The connectors and terminals shall be assembled per the connector/terminal manufacturer’s specification. Crimble/Solderless terminals shall be acceptable. Heat shrink style shall be utilized unless used within the confines of the cab.

NFPAA Required Testing of Electrical System

The apparatus shall be electrical tested upon completion of the vehicle and prior to delivery. The electrical testing, certifications, and test results shall be submitted with delivery documentation per requirements of NFPA 1901. The following minimum testing shall be completed by the apparatus manufacturer:

1. Reserve capacity test:

The engine shall be started and kept running until the engine and engine compartment temperatures are stabilized at normal operating temperatures and the battery system is fully

charged. The engine shall be shut off and the minimum continuous electrical load shall be activated for ten (10) minutes. All electrical loads shall be turned off prior to attempting to restart the engine. The battery system shall then be capable of restarting the engine. Failure to restart the engine shall be considered a test fail.

2. Alternator performance test at idle:

The minimum continuous electrical load shall be activated with the engine running at idle speed. The engine temperature shall be stabilized at normal operating temperature. The battery system shall be tested to detect the presence of battery discharge current. The detection of battery discharge current shall be considered a test failure.

3. Alternator performance test at full load:

The total continuous electrical load shall be activated with the engine running up to the engine manufacturer's governed speed. The test duration shall be a minimum of two (2) hours. Activation of the load management system shall be permitted during this test. However, an alarm sounded by excessive battery discharge, as detected by the system required in NFPA 1901 Standard, or a system voltage of less than 11.7 volts DC for a 12 volt nominal system, for more than 120 seconds, shall be considered a test failure.

4. Low voltage alarm test:

Following the completion of the above tests, the engine shall be shut off. The total continuous electrical load shall be activated and shall continue to be applied until the excessive battery discharge alarm activates. The battery voltage shall be measured at the battery terminals. With the load still applied, a reading of less than 11.7 volts DC for a 12 volt nominal system shall be considered a test failure. The battery system shall then be able to restart the engine. Failure to restart the engine shall be considered a test failure.

NFPA Required Documentation

The following documentation shall be provided on delivery of the apparatus:

- A. Documentation of the electrical system performance tests required above.
- B. A written load analysis, including:
 - a. The nameplate rating of the alternator.
 - b. The alternator rating under the conditions.
 - c. Each specified component load.
 - d. Individual intermittent loads.

Vehicle Data Recorder

A vehicle data recorder system will be provided to comply with NFPA 1901, 2009 edition. The following data will be monitored:

- Vehicle speed MPH
- Acceleration (from speedometer) MPH/Sec.
- Deceleration (from speedometer) MPH/Sec.
- Engine speed RPM
- Engine throttle position % of full throttle
- ABS Event On/Off
- Seat occupied status Occupied Yes/No by position
- Seat belt status Buckled Yes/No by position
- Master Optical Warning Device Switch On/Off
- Time: 24 hour time
- Date: Year/Month/Day

Occupant Detection System

There will be a visual and audible warning system installed in the cab that indicates the occupant buckle status of all cab seating positions that are designed to be occupied during vehicle movement.

The audible warning will activate when the vehicle's park brake is released and a seat position is not in a valid state. A valid state is defined as a seat that is unoccupied and the seat belt is unbuckled, or one that has the seat belt buckled after the seat has been occupied.

The visual warning will consist of a graphical representation of each cab seat in the multiplex display screen that will continuously indicate the validity of each seat position.

The system will include a seat sensor and safety belt latch switch for each cab seating position, audible alarm and wiring harness.

Electrical Connection Protection

The vehicle electrical system will be made more robust by the application of a corrosion inhibiting spray coating on all exposed electrical connections on the chassis and body. If equipped with an aerial device, the exposed connections on the aerial components will also be protected.

The coating will use nanotechnology to penetrate at the molecular level into uneven surfaces to create a protective water repellant film. The coating will protect electrical connections against the environmental conditions apparatus are commonly exposed to.

Cab Control Console

The control center console will be fabricated of minimum .125 inch smooth aluminum and will be installed between the driver and officer seat. The base of the console will be custom trim-fit to the chassis floor line and be securely fastened.

This area will serve as the main electrical distribution point for all chassis related functions and contain the majority of the hardware related to these functions.

Rocker Switch Panel

All specified lighting fixtures and electrical components will be activated by rocker style switches. The switches will be located on a separate embossed electrical panel, fabricated with aluminum complete with backlit name tags describing the function of each individual switch and installed on the console specified.

An internally lighted red rocker switch will be furnished on the left and identified as the "MASTER WARNING".

12-Volt Charger Port

A USB charger port will be installed in the top of the console. It will be provided with a tethered rubber cover. It will be wired directly to battery hot.

Battery Switch

There will be a rotary style battery disconnect switch installed on the floor left of the driver's seat to activate the battery system.

Auto Throttle

Engine will increase in RPM to a preset amount if the battery voltage drops below 11.7V and the pump is not engaged or transmission placed in drive gear.

Hazard Light in Cab

There will be a LED "Door Open" indicator light provided and installed in the chassis cab. The light will be installed on the console and will activate when the parking brake is released and a compartment door or any additional specified accessible devices are not in the completely closed positions.

A warning placard will be installed in the apparatus cab near the light, stating "Do Not Move Apparatus When Light Is On."

Battery Charger

A minimum 45-amp (12 volt) battery charger/conditioner will be provided and installed in the "best fit" location as determined by the apparatus manufacture.

The battery charger will automatically regulate operation output to a single battery bank. A built in sensing circuit will check the battery voltage 120 times per second, to compensate for voltage drop in charging wires and provide quick recharge, with no overcharge.

Shoreline Receptacle w/ Auto Eject

A Kussmaul "Super Auto-Eject" 120 volt 20 amp shoreline receptacle will be installed on the apparatus. It will automatically eject the plug when the starter button is depressed.

The electrical current will be interrupted before the plug is automatically ejected to prevent arcing. The plug for the receptacle will be shipped loose for installation on the shoreline cord.

The shoreline connection will be installed under the driver's door step area at the lower step level and placed forward of the immediate stepping area where space allows.

The electrical inlet will be connected to the battery charger.

The shoreline inlet connection will include a yellow cover.

DOT Lighting

There will be seven (7) lights located on the rear of the apparatus. Three (3) of the lights will be mounted on the rear of the apparatus center location, for use as identification lamps. Two (2) additional lights will be located on the rear outboard locations, one (1) each side as high as possible. Two (2) lights will be mounted in the rubrails on the sides facing the side at the rear corners, for use as clearance lamps.

Rear Tail Light Assembly

There will be Whelen 600 series Super LED rear tail light assemblies provided and installed with the apparatus, one (1) each side at the rear.

The following will be installed in each taillight stack:

One (1) 604BTTC red brake/tail light with clear lenses

One (1) 604TC amber arrow turn signal light with clear lenses and populated arrow flash pattern

One (1) 604BU clear backup light

One (1) 60R02FCR warning light on the bottom of the stack

They will be mounted in PLAST4V chrome flanges provided for each tail light assembly.

Engine Compartment Light

There will be one (1) 12 volt LED work light installed in the engine compartment on the firewall. The light will have an integrated on/off switch.

Cab Step Lights

There will be a LED light installed underneath each of the apparatus cab steps meeting NFPA1901 lumen requirements. The lights will be positioned to provide illumination to the ground area or the lower step under the cab entry doors.

The lights will be activated by the opening of any cab door and work light switch in the cab console.

Under Body Lights

There will be one (1) perimeter light mounted centered under the front bumper to illuminate the ground area under the bumper.

The under bumper perimeter lights will illuminate the area with the activation of the work light switch in the cab dash and with the parking brake applied.

One (1) under each side of the pump house running boards and two (2) under the rear tailboard.

LED Intermediate Turn Signal Lighting

There will be two (2) amber intermediate turn signals and two (2) amber intermediate marker lights on the sides of the apparatus (one (1) each per side) between the front and rear axles.

The lights will be Weldon brand 9186-1500 series LED amber markers.

Intermediate Turn Signals

The intermediate turn signals will flash with the turn indicators.

Compartment Lighting

One (1) LED Strip light, Techiq E45, will be installed in each body compartment. The tube light will be centered vertically along the forward side of the door framing and at maximum length available to fit the opening.

The light in each compartment will be on a separate circuit, turning on only those lights that have open compartment doors.

LED Crosslay Flood Light

There will be one (1) LED light with clear LED wide flood lamp rated at not less than 750 lumens installed on the top center of the cross compartment. It will be capable of illuminating the entire crosslay hose bed area.

It will be manually activated by the Work Light switch located on the cab console.

LED Hosebed Flood Light

There will be an LED minimum 6:00 x 3.00 inch LED flood light with clear lens located at the front of the hosebed rated at not less than 1900 lumens capable of illuminating the entire hosebed area.

It will be manually activated by the Work Light switch located on the cab console.

WHELEN SCENE LIGHTS

There will be four (4) Whelen 900 LED (model 9SC0ENZR) gradient Opti-Scenelight™ installed on the body sides of the apparatus, two (2) on each side; one (1) located at the front and one (1) located at the rear corner of the body side walls for a total of four (4).

They will be activated by a switch marked “Work Light” located on the cab console.

REAR BODY SCENE / WORK LIGHTS

There will be two (2) Whelen 900 LED (model 9SC0ENZR) gradient Opti-Scenelight™ installed on the rear facing vertical surface of the body, one (1) on each side.

They will be activated by a switch marked “Work Light” located on the cab console or whenever the apparatus is placed in the reverse mode of operation to access with backing.

VM8 PAINT / GRAPHICS

BODY COLOR

The body side panels will be painted to match the primary cab color.

STRIPING

CAB AND BODY STRIPE

A single Scotchlite stripe, up to 6 inches in width shall be installed on the cab and body . The stripe shall have a hockey style, Z or S style or any other customer specific design style.

The stripe shall be NFPA compliant and the size, color and location shall be as specified by the customer.

CAB AND BODY STRIPE [Qty: 2]

An additional Scotchlite stripe, up to 3 inches in width shall be installed on the cab and body.

The stripe shall be NFPA compliant and the design, size, color and location shall be as specified by the customer.

REAR CHEVRON STRIPE

Printed chevron style Scotchlite striping shall be provided on the rear of the apparatus. The stripes shall consist of 6" red/lemon yellow alternating stripes in an "A" pattern. The striping shall be located full width on rear of body each side of B1. Colors shall be Red/Lemon yellow. Does not include B1 Door.

WARRANTY / STANDARD & EXTENDED

General 1 Year Warranty

Purchaser shall receive a General One (1) Year or 24,000 Miles limited warranty in accordance with, and subject to, warranty certificate RFW0001. The warranty certificate is incorporated by reference into this proposal, and included with this proposal or available upon request.

Body Structural (Aluminum) Warranty

Purchaser shall receive a Body Structure (Aluminum) Fifteen (15) Years or 100,000 Miles limited warranty in accordance with, and subject to, warranty certificate RFW0503. The warranty certificate is incorporated by reference into this proposal, and included with this proposal or available upon request.

Electrical Warranty

Purchaser shall receive an Electrical One (1) Year or 18,000 Miles limited warranty in accordance with, and subject to, warranty certificate RFW0201. The warranty certificate is incorporated by reference into this proposal, and included with this proposal or available upon request.

Paint and Finish (FRP Panels) Warranty

Purchaser shall receive a Paint and Finish (Exterior FRP Panels) Twelve (12) Years limited warranty in accordance with, and subject to, warranty certificate RFW0722. The warranty certificate is incorporated by reference into this proposal, and included with this proposal or available upon request.

SUPPORT, DELIVERY, INSPECTIONS AND MANUALS

Electronic Manuals

Two (2) copies of all operator, service, and parts manuals **MUST** be supplied at the time of delivery in digital format -NO EXCEPTIONS! The electronic manuals shall include the following information:

- Operating Instructions, descriptions, specifications, and ratings of the cab, chassis, body, aerial (if applicable), installed components, and auxiliary systems.
- Warnings and cautions pertaining to the operation and maintenance of the fire apparatus and firefighting systems.
- Charts, tables, checklists, and illustrations relating to lubrication, cleaning, troubleshooting, diagnostics, and inspections.
- Instructions regarding the frequency and procedure for recommended maintenance.
- Maintenance instructions for the repair and replacement of installed components.
- Parts listing with descriptions and illustrations for identification.
- Warranty descriptions and coverage.

The electronic document shall incorporate a navigation page with electronic links to the operator's manual, service manual, parts manual, and warranty information, as well as instructions on how to use the manual. Each copy shall include a table of contents with links to the specified documents or illustrations.

The electronic document must be formatted in such a manner as to allow not only the printing of the entire manual, but to also the cutting, pasting, or copying of individual documents to other electronic media, such as electronic mail, memos, and the like.

A find feature shall be included to allow for searches by text or by part number.

These electronic manuals shall be accessible from any computer operating system capable of supporting portable document format (PDF). Permanent copies of all pertinent data shall be kept file at both the local dealership and at the manufacturer's location.

NOTE: Engine overhaul, engine parts, transmission overhaul, and transmission parts manuals are not included.