

Customer: CORONA FIRE DEPT

TESTING COMPLIANCE STANDARD

NFPA Compliance

The E-ONE supplied components of the vehicle shall meet the requirements of NFPA 1906, 2016 edition.

Hose Bed Capacity

Hosebed hoseload allowance on the apparatus shall be 500 lbs.

CHASSIS PREP

Wildland Pumper Fire Apparatus Prep

The commercial chassis shall be made ready for installation of components required by the fire apparatus specifications such as warning lights and sirens, cab wire harness, etc. Preparation shall also include relocating of components as necessary to meet the fire apparatus requirements such as exhaust tail pipe, air system components, batteries, etc.

Hood Mounted Air Horns

Dual Grover stuttertone hood mounted air horns with a driver side foot switch to be supplied and installed by Navistar.

BUMPERS

Front Bumper Package

A 20" integral frame bumper extension shall be provided with an .125" (1/8") diamond plate gravel shield and OEM bumper painted lower job color. The gravel shield will be supported with a formed plate attached to the front bumper and frame extension to allow rigidity of the gravel shield and bumper.

The extension will be equipped with three (3) trays; each tray to hold a minimum of 100' of 1 3/4" DJ hose. One (1) center tray shall be provided between the frame rails with a .125" (1/8") diamond plate door. The door shall be equipped with a D-ring latch, gas shock and dual notches for pre-connected hoses. There shall be two (2) trays located one (1) each side outboard of the frame rails. Outboard trays shall be provided with nylon straps with quick release buckles. All trays shall be provided with Turtle Tile and drain holes.

TIRE OPTIONS

Tire Pressure Indicators

The apparatus shall be provided with Real Wheels AirGuard LED tire pressure indicating valve stem caps. When the tire is under inflated by 5-10 PSI, the LED indicator on the cap shall flash red. The indicator housings shall be shock resistant and constructed from polished stainless steel. The indicators shall be calibrated by attaching to valve stem of a tire at proper air pressure per load ratings and easily re-calibrated by simply removing and re-installing them during service.

Real Wheel Part number RWC1234 was superseded by RWC1235 as of June 2015

ENGINES & TRANSMISSIONS

Vehicle Speed

Chassis speed shall be electronic limited and not to exceed a maximum of 68 MPH. Note: Speed rating may be lower based on OEM tire ratings/top speed limitations provided on chassis.

Commercial Cummins Engine

The chassis shall be equipped with a Cummins L9 six-cylinder, EPA compliant, electronic engine.

The engine shall be 360HP @ 2200 RPM with 1150 lb/ft @ 1200 RPM.

EXHAUST OPTIONS

Exhaust End Modification

The end of the exhaust tail pipe shall be provided with a Plymovent Magnetic Grabber exhaust end for an in-house exhaust extraction system. The tail pipe will be at 90 degrees and straight out below the side of body. The bolt-on end shall be installed on the tail pipe to properly position the Plymovent nozzle.

CHASSIS OPTIONS

Chassis Trim Package

The driver and officer side of the cab shall be provided with an aluminum diamond plate trim package. Trim package shall include steps provided on the upper and lower areas below each cab door constructed of .188" (3/16") aluminum diamond plate. A compartment constructed of 12 gauge 304L stainless steel shall be provided with double doors between the upper and lower steps below each rear cab door.

All stepping surfaces on the trim package shall be in accordance with NFPA by including a multi-directional aggressive gripping surface incorporated into the aluminum diamond plate. This surface shall extend vertically from the diamond plate a minimum of .125" (1/8") and shall be 1" in diameter in design with a minimum of 4" on center.

Double compartment doors shall be constructed using a box configuration. The outer door pans shall be constructed from 3/16" (0.188") aluminum plate. The inner door pans shall be constructed from 1/8" (0.125") smooth aluminum plate and shall have nutsert fittings to attach hold-open hardware.

The compartment openings shall have a closed-cell "P" EPDM sponge gasket meeting ASTM D-1066 2A4 standards installed around the perimeter to provide a seal that is resistant to oil, sunlight, and ozone.

A polished stainless steel locking Hansen D-ring style twist-lock door handle with #459 latch shall be provided on the primary door. The 4-1/2" (4.5") D-ring handle shall be mounted directly to the door latching mechanism with screws that do not penetrate the door material for improved corrosion resistance.

The secondary door shall have two (2) dual stage rotary latches, each with a 750 lb rating to hold the door in the closed position. The latches shall be mounted at the top and bottom of the door. A stainless steel paddle style handle shall be mounted on the interior pan of the door to actuate the rotary latches. The paddle handle shall be connected to the rotary latches by 5/32" (.156") diameter rods. Cable actuation shall be deemed un-acceptable due to the potential for cable stretch and slippage. The striker pins shall be 3/8" (.38") diameter with slotted mounting holes for adjustment.

The compartment doors shall be securely attached with a full-length stainless steel 1/4" (0.25") rod piano-type hinge isolated from the body and compartment doors with a dielectric barrier. The doors shall be attached with machine screws threaded into the door frame. The doors shall have a gas shock-style hold-open device and stainless steel scuff plates.

Each compartment shall be provided with a roll-out tray and 500lb capacity slides. Slides shall be provided with a lock-in and lock-out feature. Trays shall be constructed of .188" (3/16") smooth aluminum with 4" vertical sides. Driver side tray shall be provided with "egg crate" dividers and designed for maximum size of opening. Officer side shall be designed to carry three (3) chassis batteries with open storage ahead of tray.

A 14 gauge brushed stainless steel guard with rubber skirt shall be provided between the upper steps and cab. The guard shall run full length of the driver and officer sides of the cab. The guard shall be attached to the lower area of the cab below the cab doors.

Tow Package

One (1) tow plate shall be provided through the center front bumper. The frame mounted triangular plate shall be constructed of .75" (3/4") steel and protrude approx. 6" past the bumper.

The tow plate shall include a 3” x 4” rectangle “tow eye”. A 2” hitch receiver shall be provided below the tow plate. The receiver shall be for use with a removable hose roller. Not for towing or winch applications.

One (1) tow plate shall be provided between the rear frame rails. The plate shall be constructed of .75” (3/4”) steel with a subframe mounted to the frame rails. Tow plate will not protrude past the rear tailboard. The tow plate shall include a 3” x 4” rectangle “tow eye”. A 2” hitch receiver shall be incorporated into the tow plate design. The receiver shall be for use with a removable hose roller only. Not for towing or winch applications.

CAB MODEL

Cab Model

CAB 4DR INTL HV507 4x4.

CAB BADGE PACKAGE

Logo Package

The apparatus shall have manufacturer logos provided on the cab and body as applicable.

MISC EXTERIOR CAB OPTIONS

Label ``Diesel Fuel Only``

Located above each fuel filler housing shall be a metallic label that designates ”Diesel Fuel Only” requirements. It shall be black with white or equivalent contrasting letters a minimum of 1/2” high.

Mud Flap Heights

The bottom of the body and cab mud flaps shall be approximately twelve (12”) from the ground.

SEATS

Seating Capacity Tag

A tag that is in view of the driver stating seating capacity of four (4) personnel shall be provided.

MISC INTERIOR CAB OPTIONS

Cab Console

A center cab console constructed of .125" (1/8") smooth aluminum painted Scorpion black shall be provided. The console shall be centrally located and shall allow the driver and/or officer access to all components while seated with seat belts secured.

The console shall feature a forward area for mounting of switches, siren, gauges and other required components. The rearward area shall be provided with a map box capable of holding a minimum of 8.5" x 11" binders with a hinged lid. The map box shall be provided with two (2) removable hanging file dividers and a removable false floor for electrical components mounted below.

The console shall be equipped with a ventilation fan(s) for electrical equipment mounted within the console.

Rear Cab Console

A center cab console constructed of .125" (1/8") smooth aluminum painted Scorpion black shall be provided. The console shall be centrally located in the rear of the cab and shall allow access to all components while seated with seat belts secured.

The console shall be provided with two (2) cup holders, two (2) Kussmaul dual port USB product code 091-264-N. Includes USB-C and USB-A NGR outlet charger sockets and two (2) 12V 10A power leads (inside of console). Rear of console shall have a storage area for miscellaneous equipment.

CAB ELECTRICAL OPTIONS

Cab Dome Lights

A Whelen model 60CREGCS LED dome light shall be installed. The light shall have twelve (12) high intensity Super LEDs; six (6) white and six (6) red. Two (2) switches shall be provided on the face of the light to activate the red or white lights. The white light shall activate with appropriate cab door and light assembly switch, the red light activates with light assembly mounted switch only.

There shall be two (2) mounted in the front of the cab, one (1) in the driver and one (1) in the officer ceiling.

There shall be two (2) mounted in the rear of the cab, one (1) in the driver side and one (1) in the officer side ceiling.

BODY MODEL

Body

The compartment floors, ceilings, front panels, vertical side sheets, rear walls, door openings, wheel wells, compartment panels, dividing walls, and reinforcements shall be constructed of 12 gauge 304L stainless steel material. The interior of the compartments shall be provided with a machine sanded DA finish. The exterior of the body shall have an .125" (1/8") smooth aluminum overlay prepared for job color paint finish.

To eliminate unnecessary seams and overlapping areas, the construction of all component panels shall feature break-formed fabrication. Component panels shall be in single metal sections wherever possible.

The assembly of body components shall be with Huck bolt fasteners. All fasteners utilized on the substructure crossmembers and associated assemblies will be precision engineered Huck® fasteners.

Structural supports shall be incorporated into the overall design to provide the necessary support for component panels and body modules.

The body shall be a free standing module supported only by the top of the frame rails using a transverse 3/16" thick 304L stainless steel structure assembly. This structure shall be secured in a minimum of six (6) locations, using a double flex mount system and angle brackets bolted to both the body structural assembly and the sides of the chassis frame rails using Grade 8 fasteners. Mylar shall be used to isolate the structural assembly from the frame rails. This design is required to eliminate shift and stress on the body module and component panels.

The water tank shall be mounted on a 304L stainless steel tubular structure at the base of the tank.. Hold downs shall allow for chassis flex front and rear on the tank, without transmitting stress into the water tank. Isolating materials of hard rubber strips shall be installed at all contact points between the base of the tank and the tank mounting structure.

Each compartment door opening shall have at least a double break-formed door jamb for recessed door seal inboard of the exterior of the body. The break-formed door jamb is required for superior strength and body construction integrity. A brushed stainless steel scuff plates shall be provided at each lower compartment openings.

The compartment floor construction shall permit easy cleaning with a true sweep-out design. There shall be a minimum of two (2) 1/4" drain holes in the compartment floors.

Each interior compartment seam shall be sealed with a silver silicone caulk. The rear walls of each compartment shall be provided with a minimum 2" weber style vent with fire resistant filters.

Driver Side Design

There shall be one (1) compartment (L1) over the rear wheels. The compartment shall be approximately 55" wide x 40" high x 23.5" deep and contain approximately 29.92 cubic feet of storage space. The door opening shall be approximately 52.5" wide x 38.75" high.

There shall be one (1) compartment (L2) behind the rear wheels. The compartment shall be approximately 40" wide x 60" high x 23.5" deep and contain approximately 32.64 cubic feet of storage space. The door opening shall be approximately 37.5" wide x 58.75" high.

Officer Side Design

There shall be one (1) compartment (R1) over the rear wheels. The compartment shall be approximately 55" wide x 40" high x 12" deep and contain approximately 15.28 cubic feet of storage space. The door opening shall be approximately 52.5" wide x 38.75" high.

There shall be one (1) compartment (R2) behind the rear wheels. The compartment shall be approximately 40" wide x 42.5" high x 12" deep (upper) and 40" wide x 17.5" high x 23.5" deep (lower) and contain approximately 21.33 cubic feet of storage space. The door opening shall be approximately 37.5" wide x 58.75" high.

Rear Body Design

The rear body shall be designed to provide equipment storage, ground ladder storage, hard suction storage and hose deployment.

There shall be one (1) compartment (B1) on the rear of the body. The compartment shall be approximately 46" wide x 49.5" high x 19.75" deep and contain approximately 26.02 cubic feet of storage space. The door opening shall be approximately 28.5" wide x 32.75" high.

One (1) ground ladder storage tunnel shall be provided at the rear officer side of the body. The tunnel shall hold one (1) 20' 3-section ladder on beam, one (1) backboard, one (1) 8' pike pole, one (1) 5' digging bar and one (1) 8' rubbish hook. All equipment shall be held in place with mechanical holds. A single pan door painted job color shall be provide with a quarter turn D-ring handle and stainless steel hinge.

Compartment Doors

Double compartment doors shall be constructed using a box configuration. The outer door pans shall be constructed from 3/16" (0.188") aluminum plate. The inner door pans shall be constructed from 1/8" (0.125") smooth aluminum plate and shall have nutsert fittings to attach hold-open hardware.

The compartment door openings shall have a 1" x 9/16" (1" x 0.43") closed-cell "P" EPDM sponge gasket meeting ASTM D-1066 2A4 standards installed around the perimeter of the openings to provide a seal that is resistant to oil, sunlight, and ozone.

A polished stainless steel locking Hansen D-ring style twist-lock door handle a with #459 latch shall be provided on the primary door. The 4-1/2" (4.5") D-ring handle shall be mounted directly to the door latching mechanism with screws that do not penetrate the door material for improved corrosion resistance.

The secondary door shall have two (2) dual stage rotary latches, each with a 750 lb rating to hold the door in the closed position. The latches shall be mounted at the top and bottom of the door. A stainless steel paddle style handle shall be mounted on the interior pan of the door to actuate the rotary latches. The paddle handle shall be connected to the rotary latches by 5/32" (.156") diameter rods. Cable actuation shall be deemed un-acceptable due to the potential for cable stretch and slippage. The striker pins shall be 3/8" (.38") diameter with slotted mounting holes for adjustment.

The compartment doors shall be securely attached to the apparatus body with a full-length stainless steel 1/4" (0.25") rod piano-type hinge isolated from the body and compartment doors with a dielectric barrier. The doors shall be attached with machine screws threaded into the doorframe.

The doors shall have a gas shock-style hold-open device. The gas shocks shall have a 30 lb rating and be mounted near the top of the door (when possible).

An anodized aluminum drip rail shall be mounted over the compartment opening to assist in directing water runoff away from the compartment.

The door(s) shall be installed in the following location(s): L1, L2, R1, R2, B1.

Fender Wells

Fender wells constructed of black ABS shall be provided. A stainless steel bolt-on fenderette shall be provided for each fender well. Mudflaps shall be provided on the rear of each fender well.

SCBA Bottle Tubes

Four (4) Fire Shopp brand SCBA bottle storage with hinged brushed stainless steel doors shall be provided in the body wheel well area. The storage tubes shall be located two (2) each side on the forward and rearward wheel well areas.

Straps shall be provided in each exterior storage compartment to provide secondary means to hold each SCBA bottle in the compartment. The straps shall be constructed from 1" nylon webbing formed in a loop. The strap(s) shall be mounted to the storage compartment ceiling directly inside the door opening at each bottle location.

Rubrails

The body shall have rub rails mounted below L2/R2 compartments.

The rub rail shall be C-channel in design and constructed of 3/16" thick 6463T6 anodized aluminum extrusion. The rub rail shall be 2.75" high x 1.25" deep and shall extend beyond the body width to protect compartment doors and the body side. The rub rail depth shall allow marker and/or warning lights to be recessed inside for protection.

The top surface of the rub rail shall have minimum of five (5) raised serrations. Each serration being a minimum of .1” in height and with cross grooves to provide a slip-resistant edge for the tailboard step and pump module running board areas. The rub rail shall be mounted a minimum of 3/16” off the body with nylon spacers. The ends of each section shall be provided with a finished rounded corner piece.

Tailboard/Flip Down Step

A three (3) piece rear tailboard assembly constructed of 3/16” (0.188”) aluminum diamond plate with support structures shall be provided. The center of the rear tailboard shall be provided with an aluminum grip strut flip down step.

Tailboard stepping surfaces shall be in accordance with NFPA by including a multi-directional aggressive gripping surface incorporated into the aluminum diamond plate. This surface shall extend vertically from the diamond plate a minimum of .125” (1/8”) and shall be 1” in diameter in design with a minimum of 4” on center.

BODY COMPT LEFT SIDE

Driver Side Roof Top Compartments

Two (2) driver side roof compartments shall be provided. The compartments shall be integral to the driver side assembly.

The compartments shall be transverse front to rear and shall include flooring. The flooring shall be smooth plate and shall have drain holes to prevent the accumulation of water.

The compartment top lids shall be raised and constructed of 1/8” (.125”) aluminum treadplate. The lids shall include stainless steel hinges and shall be hinged to the outside of the compartment. Each lid shall include thumb latches, grab handle(s) and be wired to the door ajar indicator in the cab.

Lighting shall be provided for each compartment. The lights shall illuminate when the compartment lid is in the open position.

BODY COMPT RIGHT SIDE

Officer Side Roof Top Compartments

Two (2) officer side roof compartments shall be provided. The compartments shall be integral to the officer side assembly.

The compartments shall be transverse front to rear and shall include flooring. The flooring shall be smooth plate and shall have drain holes to prevent the accumulation of water.

The compartment top lids shall be raised and constructed of 1/8" (.125") aluminum treadplate. The lids shall include stainless steel hinges and shall be hinged to the outside of the compartment. Each lid shall include thumb latches, grab handle(s) and be wired to the door ajar indicator in the cab.

Lighting shall be provided for each compartment. The lights shall illuminate when the compartment lid is in the open position.

PUMP MODULE

Pump Module

The pump panel/auxiliary pump module sub-frame shall be a self-supported structure mounted independently from the main body and apparatus cab. The design must allow for frame deflection without imposing stress on the pump panel structure or side running boards. The module shall be a welded frame utilizing structural stainless steel components properly braced to withstand the rigors of off-road operations.

Lower Pump Module

A lower pump enclosure module shall be installed. The substructure shall be constructed entirely of 12 gauge 304L stainless steel using a break-formed design for the components. 1/4" thick 304L stainless steel break-formed support members shall provide attachment for the 12 gauge substructure and the exterior panels.

The pump module shall be 28" wide front to back, plus flex joints. The enclosure shall be a free standing module supported only by the frame rails in a minimum of four locations and secured with 1/2" diameter Grade 8 bolts on the side of the chassis frame rails. The support members shall be isolated from the frame rails using Mylar. This design is required to eliminate shift and stress on the pump enclosure, pump panels and running boards. A pump enclosure constructed using carbon steel or any other mounting method is not acceptable.

Pump Panels

Two (2) brushed 14 gauge 304L stainless steel pump control panels shall be fabricated and installed on the left and right side of the apparatus and shall be attached using stainless steel fasteners.

The pump operator's control panel shall be located on the left side of the apparatus and feature a full width hinged gauge access panel. The lower portion of the pump panel encompassing the discharge and suction valves shall be hinged. This shall be maximum size of available space, vertically hinged and held closed with stainless steel fasteners. For best uniform appearance, all brushed finish on the stainless steel trim pieces shall run in the same horizontal direction.

Both side pump panels shall be designed to be completely removable for easy access and servicing of valves, plumbing or related pump components.

Pump panel trim plates fabricated from the same material as the pump panels shall be provided around each discharge and suction intake valve. The trim plates shall be designed to allow accessibility to the respective valve for service or repairs.

Upper Pump Module

The upper pump enclosure area shall be built of 304L stainless steel with brushed stainless steel outer trim to blend with the lower module trim pieces. Overall height of the finished pump enclosure shall not exceed 87".

Crosslay Hose Compartment

A vertically divided transverse hose bed shall be located above the pump panel on top of the pump module as far forward as possible. The hose bed shall be large enough to accommodate up to 200 ft. of 1-3/4" preconnected double jacket fire hose. It shall be approximately 5" wide by 34" high, by full pump module width. The vertical divider shall be located in the center of the bed, providing for equally sized storage areas. The hose bed shall be provided with a single, full width, aluminum treadplate cover, be hinged on the forward side with a polished stainless steel hinge, complete with end skirts, straps, and quick-release buckles. End skirt color shall match the hose bed cover end flaps.

The crosslay hose bed floor shall be removable anodized aluminum slats.

Storage Area

The area above the enclosure shall be NFPA complaint non-skid aluminum treadplate.

Running Boards

Two (2) running boards constructed of 3/16" (.188") aluminum diamond plate shall be bolted to the pump enclosure substructure. Running boards shall be a minimum of 8" deep.

Stepping surfaces on the running boards shall be in accordance with NFPA by including a multi-directional aggressive gripping surface incorporated into the aluminum diamond plate. This surface shall extend vertically from the diamond plate a minimum of .125" (1/8") and shall be 1" in diameter in design with a minimum of 4" on center.

Handrails shall be provided on the pump module each side in accordance with NFPA for ascension and egress from the running boards

Officer Compartment

A vertically hinged single door compartment shall be provided and located on the officer side pump panel below the crosslay. The interior compartment dimensions shall be approximately 24.5" wide x 44" high x 15" deep. This compartment shall be manufactured to be part of the right pump panel/auxiliary pump assembly module. The compartment floor construction shall permit easy cleaning with a true sweep-out design. There shall be a minimum of two (2) 3/8" drain holes in the compartment floors. A removable access panel shall be provided on the back wall to access plumbing in the module.

A single compartment door shall be constructed using a box configuration. The outer door pan shall be constructed from 3/16" (0.188") aluminum plate. The inner door pan shall be constructed from 1/8" (0.125") smooth aluminum plate and shall have nutsert fittings to attach hold-open hardware.

A polished stainless steel locking Hansen D-ring style twist-lock door handle with #459 latch shall be provided on the door. The 4-1/2" (4.5") D-ring handle shall be mounted directly to the door latching mechanism with screws that do not penetrate the door material for improved corrosion resistance.

The compartment door shall be securely attached to the pump module with a full-length stainless steel 1/4" (0.25") rod piano-type hinge isolated from the module and compartment door with a dielectric barrier. The door shall be attached with machine screws threaded into the doorframe.

The door shall have a gas shock-style hold-open device. The gas shock shall have a 30 lb rating and be mounted near the top of the door (when possible).

WATER TANK

500 Gallon Water Tank

A 500 gallon (U.S.) booster tank shall be supplied.

The booster tank shall be constructed of polypropylene material. The booster tank shall be completely removable without disturbing or dismounting the apparatus body structure. The top of the booster tank is fitted with removable lifting assembly designed to facilitate tank removal.

The booster tank top, sides, and bottom shall be constructed of a minimum 1/2" (0.50") thick black UV-stabilized copolymer polypropylene. Joints and seams shall be fused using nitrogen gas as required and tested for maximum strength and integrity. The tank construction shall include technology wherein a sealant shall be installed between the plastic components prior to being fusion welded. This sealing method will provide a liquid barrier offering leak protection in the event of a weld compromise. The tank cover shall be constructed of 1/2" thick polypropylene and UV stabilized, to incorporate a multi-piece locking design, which allows for individual removal and inspection if necessary. The tank cover(s) shall be flush or recessed 3/8" from the top of the tank and shall be fused to the tank walls and longitudinal partitions for maximum integrity. Each one of the covers shall have hold downs consisting of 2" minimum polypropylene dowels spaced a maximum of 40" apart. These dowels shall extend through the covers and will assist in keeping the covers rigid under fast filling conditions.

The tank shall have a combination vent and manual fill tower with a hinged lid. The fill tower shall be constructed of 1/2" polypropylene and shall be a typical dimension of 8" x 8" outer perimeter (subject to change for specific design applications). The fill tower shall indicate that it is a water-only fill tower. The tower shall have a 1/4" thick removable polypropylene screen and a polypropylene hinged cover. The capacity of the tank shall be engraved on the top of the fill tower lid.

The booster tank shall have two (2) tank plumbing openings. One (1) for a tank-to-pump suction line with an anti-swirl plate, and one (1) for a tank fill line. All tank fill couplings shall be backed with flow deflectors to break up the stream of water entering the tank and be capable of withstanding sustained fill rates per the tank fill inlet size.

The sump shall be constructed of a minimum of 1/2" polypropylene. The sump shall have a minimum 3" N.P.T. threaded outlet for a drain plug per NFPA. This shall be used as a combination clean-out and drain. All tanks shall have an anti-swirl plate located approximately 3" above the inside floor.

The transverse and longitudinal swash partitions shall be manufactured of a minimum of 3/8" polypropylene. All partitions shall be equipped with vent and air holes to permit movement of air and water between compartments. The partitions shall be designed to provide maximum water flow. All swash partitions interlock with one another and are completely fused to each other as well as to the walls of the tank. All partitions and spacing shall comply with NFPA 1901. The walls shall be welded to the floor of the tank providing maximum strength.

Inside the fill tower there shall be a combination vent/overflow pipe. The vent overflow shall be a minimum of schedule 40 polypropylene pipe with an I.D. of 3" or larger that is designed to run through the tank. This outlet shall direct the draining of overflow water past the rear axle, thus reducing the possibility of freeze-up of these components in cold environments. This drain configuration shall also assure that rear axle tire traction shall not be affected when moving forward.

The booster tank shall undergo extensive testing prior to installation in the truck. All water tanks shall be tested and certified as to capacity on a calibrated and certified tilting scale.

Each tank shall be weighed empty and full to provide precise fluid capacity. Each tank shall be delivered with a Certificate of Capacity delineating the weight empty and full and the resultant capacity based on weight. Engineering estimates for capacity calculations shall not be permitted for capacity certification. The tank must be designed and fabricated by a tank manufacturer that is ISO 9001:2008 certified in each of its locations. The ISO certification must be to the current standard in effect at the time of the design and fabrication of the tank.

The tank shall have a limited Lifetime warranty that provides warranty service for the life of the fire apparatus in which the tank is installed. Warranties are transferable if the apparatus ownership changes by requesting the transfer from the tank manufacturer

FOAM TANK

External Foam Cell

An externally mounted foam cell shall be provided. The foam cell shall be located in the right side hose bed area. The cell shall have a twenty (20) gallon capacity. The tank top, sides, and bottom shall be constructed of 1/2" (0.50") black UV-stabilized copolymer polypropylene. The copolymer polypropylene tank material shall be welded together utilizing thermoplastic welding

technology. A clean hot air temperature controlled process shall ensure that each weld reaches its plasticized state without cold or hot spots. The copolymer polypropylene material shall be used for its high strength and corrosion resistance for a prolonged tank life.

The foam tank shall have a mesh filler screen of stainless steel or poly recessed 4" to 6" to allow filling without back-splash. The tank shall be equipped with a positive sealing pressure/vacuum vent type cap, a low foam concentrate sensor that turns off the foam pump at a pre-set level, a visual sight gauge, a foam concentrate transfer system, a brass or stainless steel drain valve located at the lowest point of the foam tank and a brass or stainless steel cleanable strainer installed in the supply line from the foam tank to the foam pump.

Foam Tank Drain Valve

A 3/4" brass or stainless steel foam tank drain valve and drain hose shall be provided to completely drain and flush the foam tank. The drain hose (Aeroquip or equal) shall terminate below the left pump panel and have brass or stainless steel swivel fittings at the tank and drain valve to facilitate valve and/or tank removal. The T-handle drain valve shall be located on the lower side of the left pump panel and be properly labeled.

HANDRAILS / STEPS

Rear Handrails / Steps

Six (6) Cast Products 8" x 8" wedge type steps, model SP2012, with hand holds shall be provided at the rear of the body. A brushed stainless steel scuff plate shall be provided above each step. Steps shall be oriented on the rear of the body for ease of access to the hosebed and upper storage areas.

Four (4) handrails shall be at the rear of the body. Two (2) vertical 18" handrails; one (1) each side outboard of steps, one (1) horizontally mounted 48" handrail below hosebed and one (1) 8" on rear face of upper compartment.

The handrails shall be constructed of 6063T5 1.25" OD anodized aluminum tube, with an integral ribbed surface to assure a good grip for personnel safety, mounted between chrome stanchions.

MISC BODY OPTIONS

Mud Flaps

Black mud flaps with E-ONE logo shall be provided for the body wheel wells.

Hosebed / Upper Compartments

Hosebed

The area above the booster tank shall have (2) hose storage areas provided. One (1) hosebed shall be provided on the driver side and one (1) on the officer side. Each hosebed shall be approximately 24" wide x 18" high x 80" deep with a total capacity of 40 cubic feet of storage.

Each hose bed shall be constructed entirely from maintenance-free, 3/4" deep x 7.5" wide, extruded aluminum slats that shall be pop-riveted into a one-piece grid system. Each slat shall have all sharp edges removed and have an anodized ribbed top surface that shall prevent the accumulation of water and allow for ventilation of wet hose.

The hose bed design shall incorporate adjustable tracks in the forward area and the rearward area of the hose bed for the installation of an adjustable divider(s). The adjustable tracks shall hold an adjustable divider(s) mounting nut straight, so only a Philips head screwdriver is required to adjust a divider(s) from side to side (as is practical with other hose bed mounted equipment).

The hose beds shall be easily removable to allow access to the booster tank below.

Hosebed Covers

The hose bed areas shall have an aluminum hose bed cover over each area. The hose bed cover shall be provided in compliance with NFPA.

Each hose bed cover shall be constructed of 3/16" (.188") aluminum embossed treadplate with a formed aluminum brace under for stability. Each cover door shall be securely attached to the hose bed side with a full-length stainless steel piano type hinge. The hinge shall have 1/4" pins and shall be "staked" on every other knuckle to prevent pin slippage.

Each cover shall include two (2) hold opens per cover. The forward area of the cover shall have one (1) pneumatic shock. The rear of the cover shall have one (1) positive hold open/hold closed that shall include one (1) manually engaged securing pin.

Each cover shall include two (2) assist handles, one (1) grab handle (forward) and one (1) handrail (rearward). The rearward handrails shall be installed in compliance with current NFPA. The handrails shall be constructed of 6063T5 1.25" OD anodized aluminum tube, with an integral ribbed surface to assure a good grip for personnel safety, mounted between chrome stanchions.

Each cover door shall be wired to the door ajar indicator light in the cab and shall be interlocked with the parking brake per NFPA.

Two (2) covers constructed of red 18 oz. PVC vinyl coated polyester shall be installed at the rear apparatus hose bed aluminum covers. The base fabric shall be 1000 x 1300 Denier Polyester with a fabric count of 20 x 20 per square inch with a weighted bottom.

The top of each cover shall be mechanically attached to the rear hose bed cover. The lower portion of the cover shall be secured in place using California Type 3 straps sewn in place, equally spaced to meet applicable requirements of the latest edition of NFPA 1901.

Hosebed Dividers

There shall be a hose bed divider provided the full fore-aft length of each 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 each divider shall have a 3" radius corner to protect personnel and a hand hold cut-out on the trailing edge. 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.

Storage Compartments

Two (2) storage compartments shall be provided in the hosebed area. One (1) center mounted between each hosebed full length and one (1) forward of the hosebed full width.

The storage areas shall be constructed of 1/8" (.125") smooth aluminum with sanded finish and provided with a 3/16" (.188") aluminum embossed diamond plate doors. Each door shall be provided with 2" flanges on all four sides and securely attached with a full-length stainless steel piano type hinge. The hinge shall have 1/4" pins and shall be "staked" on every other knuckle to prevent pin slippage. Gas shock hold open device(s) and locking thumb latches shall be provided with each door.

Center storage dimensions shall be approximately 16" wide x 18" high x 78" deep with a capacity of 13 cubic feet of storage. Forward storage dimensions shall be approximately 61.25" wide x 18" high x 23.25" deep. Forward storage area shall house water tank fill tower and 20 gallon foam tank. Additional storage space shall be provided in the forward compartment.

I-Zone Brackets

One (1) I-Zone bracket shall be provided, one (1) each side below upper rear body steps. Each bracket shall be oriented in an upward angled position with a locking pin.

Each bracket shall be provided with a handrail extrusion constructed of 6063T5 1.25" OD anodized aluminum tube approximately 24" long. Brackets shall be provided on the secondary door of the B1 compartment to store extrusions when not in use.

Compartment Storage Package

Compartment storage packages shall be provided. It shall include the following:

L1 Compartment

Compartment shall be provided with Unistrut track on the forward, rearward and backwalls. One (1) free standing divider constructed of 1/4" (.25") sanded smooth aluminum plate on a hosebed divider base extrusion shall be provided approximately 18" off the forward wall. Divider shall be provided with Unistrut track. One (1) full width adjustable shelf constructed of 3/16" (.188") smooth sanded aluminum with four (4) 2" flanges shall be provided above the divider. One (1) adjustable shelf constructed of 3/16" (.188") smooth sanded aluminum with four (4) 2" flanges shall be provided rearward of the divider.

One (1) Ziamatic walkway bracket located ahead of the divider shall be provided on a sanded smooth aluminum plate attached to the Unistrut.

L2 Compartment

Compartment shall be provided with Unistrut track on the forward, rearward and backwalls. Two (2) full width adjustable shelves constructed of 3/16" (.188") smooth sanded aluminum with four (4) 2" flanges shall be provided equally spaced.

R1 Compartment

Compartment shall be provided with Unistrut track on the forward, rearward and backwalls. One (1) full width adjustable shelf constructed of 3/16" (.188") smooth sanded aluminum with four (4) 2" flanges shall be provided.

Three (3) Ziamatic walkway brackets equally spaced located at the back wall shall be provided on a sanded smooth aluminum plate attached to the Unistrut.

R2 Compartment

Compartment shall be provided with Unistrut track on the forward, rearward and backwalls. Two (2) full width adjustable shelves constructed of 3/16" (.188") smooth sanded aluminum with four (4) 2" flanges shall be provided. One (1) shall be provided in upper section and one (1) shall be provided in lower section.

B1 Compartment

Compartment shall be provided with Unistrut track on the forward, rearward and backwalls. One (1) full width adjustable shelf constructed of 3/16" (.188") smooth sanded aluminum with four (4) 2" flanges shall be provided.

Turtle Tile

Heavy duty black Turtle Tile brand floor matting shall be provided on all compartment floors and shelves.

PUMPS

PTO Fire Pump Specification

A Darley model JMP 500 GPM two stage fire pump shall be provided and installed. The pump unit shall be fully capable of meeting National Fire Protection Association (NFPA) #1901 Standard for fire apparatus pumps. The pump shall be fixed mounted between the chassis frame rails. Floating pump designs are not acceptable and will be cause for immediate rejection of the entire bid.

Pump casing shall be a fine grain cast iron, vertically split for greater resistance against leakage, with a minimum tensile strength of 30,000 psi. The pump contains a staging valve that allows the pump to select the volume mode for high flows and the pressure mode for selecting high pressures. Seal rings shall be renewable, double labyrinth, wrap around bronze type.

Pump Shaft

The pump shaft shall be splined to receive broached impeller hubs, for greater resistance to wear, torsional vibration, and torque imposed by engine, as well as ease of maintenance and repair. Bearings provided shall be heavy duty, deep groove, radial-type ball bearings. Sleeve bearings on any portion of the pump or transmission shall be prohibited due to wear, deflection, and alignment concerns. The bearings shall be protected at all openings from road dirt and water splash with oil seals and water slingers.

Impeller

The impeller shall be a high strength bronze alloy, splined to the pump shaft for precision fit, durability, and ease of maintenance. Impeller shaft oil seals shall be constructed to be free from steel components except for the internal lip spring. The impeller shaft oil seals shall carry a lifetime warranty against damage from corrosion from water and other fire-fighting fluids.

Mechanical Seal

The pump shall be furnished with a Darley maintenance free mechanical seal. The mechanical seal shall be a non-contacting, non-wearing dual seal design. Seal shall be a Silicon Carbide Mechanical seals with welded springs. The stationary face of mechanical seals shall be made from Silicon Carbide, and be extremely hard and of a heat dissipative material, which resists wear and dry running damage much better than conventional Ni-resist and Tungsten Carbide materials.

Pump Transmission

The transmission case shall be heavy duty cast iron with adequate oil reserve capacity to maintain low operating temperature. Pump ratio to be selected by the manufacturer's engineering department. Gears shall be helical in design and precision ground for quiet operation and extended life. Gears to be cut from high strength alloy steel, ground, and carburized. Chain drive and/or design requiring extra lubricating pump is not acceptable. Pump drive shaft shall be precision ground, heat treated alloy steel, with a 1-3/8 spline. The pump transmission shall

require no further lubrication beyond that provided by the intrinsic action of the gears, to reduce the likelihood of failure due to loss of auxiliary lubrication.

Driveline Installation

The chassis drivelines shall be sized for intended application and torque requirements. The installation shall comply with driveline manufacturer's guidelines.

Manuals

Two (2) manuals covering the fire pump transmission and selected options of the fire pump shall be provided with the apparatus.

Direct Drive PTO

A transmission mounted direct drive PTO shall be provided. The pump transmission shall be driven by a hot shift PTO operated from within the cab that interlocks in the road or pump mode. The pump shift controls shall be located in the cab within easy reach of the driver and shall include indicator lights as mandated by NFPA #1901 and #1906 latest editions.

The fire pump and gear case shall be mounted in such a manner that the PTO driveline angles do not exceed the manufacturer's recommended angles for the u-joints and shall be of the proper series and type specified by the pump and PTO manufacturers. The driveline shall be both statically and dynamically balanced.

Main Pump Controls

The main fire pump shift controls shall be mounted in the cab within easy reach of the driver and identified as "PUMP SHIFT" and shall include a permanently inscribed pump shift instruction ID plate. The pump shift controls shall include indicating lights located on the in-cab and left pump panels that advise the operator that the pump shift has been completed and it is OK to pump.

The indicating lights shall be as follows:

- 1) A "Pump Engaged" light located in the cab.
- 2) An "OK to Pump" light located in the cab to indicate the pump is engaged
- 3) A "Throttle Ready" light located on the left pump operator's panel.

The mounting location of the in-cab pump shift controls shall be in the cab center control console.

Auxiliary Fire Pump

Darley portable pump model number 1-1/2 AGE 24K shall be provided. The high pressure, high volume pump shall meet the following performance requirements:

120GPM @ 150PSI

75GPM @ 245PSI

25GPM @ 375PSI

Pump Construction

The pump shall be constructed with high strength aluminum alloy casing and discharge valve, aluminum alloy gear case and engine adapter, bronze impeller and wear rings, stainless steel impeller shaft, mechanical seal, heat treated alloy steel helical gear and ball bearing construction.

Pump Packing

The plunger injection packing glands shall have the ability to be repacked in less than 10 minutes and feature a long wearing ceramic coating to minimize friction and power loss. Plastallic injected packing supplied through an external supply cylinder shall allow for equalized pressure around the pump shaft and minimize friction.

Pump Inlet and Outlet

The pump shall have one (1) 2" NPT inlet and one (1) 2-1/2" NPT discharge shall be supplied. The discharge outlets shall be supplied with check valves.

Auxiliary Pump Plumbing

The auxiliary pump shall be plumbed in common with the main pump to provide discharge pressure to all 1" and 2" discharge valves. Stainless steel Techno-Check full flow one way check valves are required to isolate the auxiliary and main pump discharge pressure from each other.

Plumbing between the tank sump and auxiliary pump suction eye shall be Gates 4684CF 2" flexible wire reinforced suction hose (or equal) with threaded fittings. A stainless steel Techno-Check 2" one way full flow check valve shall be installed in the auxiliary pump suction hose as close to the tank sump as possible to ensure that the auxiliary pump remains primed at all times.

Engine Specification

The pump shall be powered by a 24 horsepower, three cylinder liquid cooled Kubota diesel engine. The engine shall have a spin on oil filter, dry element air cleaner, manual compression release, 12 volt electric starter, flywheel alternator and fuel pump. The pump shall have dimensions of 35" long x 22" wide x 26.25" high and a weight of 340 pounds.

Warranty

The pump shall carry a three (3) year parts replacement warranty provided by Darley with original equipment parts supplied by Darley in 72 hours after receipt of order.

Pump Location

The pump and diesel power unit shall be mounted on a sub-frame in such a manner so as to eliminate vibration while operating and to provide suitable access for performing routine maintenance. The pump and power unit assembly shall be designed so the entire assembly may be easily removed as a unit to gain access to plumbing or components below. A hinged cover with suitable latches shall be provided over the pump and power unit assembly. The area around the assembly shall remain open for maintenance and air circulation and the radiator shall be located behind a ventilated access panel.

Pump Features

The pump power unit shall be furnished as follows:

- 1) Dry element, direct mounted air filter.
- 2) Stainless steel air intake ember screen.
- 3) Exhaust system equipped with USDA approved spark arrestor and appropriate heat shields to protect various components and personnel from heat related damage/injuries from high exhaust pipe temperatures. The exhaust system shall be routed below the apparatus, horizontally discharged away from the pump panel and be manufactured from heavy duty aluminized steel exhaust pipe to meet manufacturers specifications.
- 4) Spin on automotive type fuel and oil filters that meet the engine manufacturers specifications.
- 5) Fuel system shall be designed to draw fuel from the apparatus fuel tank through the use of a 12 volt automotive electric fuel pump with pick-up tube. The pick-up tube shall be designed so as to assure the auxiliary engine will not exhaust the fuel supply of the vehicle. (minimum 10 gallon reserve)
- 6) A crankcase oil drain extension line routed below the frame to facilitate oil changes.
- 7) 12 volt electric start.

Auxiliary Pump Controls

Two (2) Digitrol water tight pump control panels shall be provided; one (1) located on the driver pump panel and one (1) located on the cab console. Each Digitrol panel shall feature a modular design with available custom harnesses for plug and play installation, (2) red OLED displays on each panel, momentary push to start/stop button with over crank protection, toggle switch with green lamp for panel power, toggle switch for high/low idle, 15 amp circuit breaker and 5 second glow plug sequence when panel is powered ON.

PLUMBING KITS

Plumbing Package

Where vibration or chassis flexing may damage or loosen plumbing or plumbing exiting the pump enclosure, Victaulic plumbing connections shall be utilized to facilitate maintenance. If necessary, Victaulic couplings shall also be located as close as possible to each pump suction inlet and discharge outlet to facilitate removal of the pump(s). Threaded piping systems except where plumbing is directly attached to the fire pump are not acceptable.

The manifolds shall be designed with Victaulic couplings to facilitate manifold/pump or valve removal and shall also meet all NFPA pressure requirements. In order to minimize friction loss, sweep type elbows shall be utilized. Threaded Schedule 40 (pipe thread) 304L stainless steel manifolds will be utilized for plumbing directly attached to the fire pump.

All flexible discharge lines other than in the suction plumbing shall be Aeroquip or equal, with a minimum of 300 psi working pressure and 1200 psi burst pressure, using full flow stainless steel couplings/fittings. All fabricated piping shall be a minimum of Schedule 10 stainless steel for superior corrosion resistance and decreased friction loss.

All plumbing for the 2" discharge valves shall be 2" pipe except for the front discharge(s), which shall be high pressure hose equal to 2" pipe. The plumbing between the two (2) front jumpline valve(s) (if specified) shall be 304L stainless steel pipe.

All intake and discharge plumbing must meet the construction requirements of NFPA 1901.

Master Drain Valve

A manual master drain valve shall be installed on the pump panel. The master pump drain assembly shall consist of a Class 1 bronze master drain with a rubber disc seal. The master drain shall have a rubber seal to prevent water from running out on the running board. The manual master drain valve shall have twelve (12) individually-sealed ports that allow quick and simultaneous draining of multiple intake and discharge lines. It shall be constructed of corrosion-resistant material and be capable of operating at a pressure of up to 600 PSI.

The master drain shall provide independent ports for low point drainage of the fire pump and auxiliary devices.

4" Suction Inlet

There shall be one (1) 4" pump suction inlet, male NH threads with a removable screen and rocker lug cap shall be provided on the left pump operator's panel.

Tank-To-Pump Valve

The 3" booster tank to main pump line shall have a quarter turn, full flow ball valve. The tank suction valve shall be controlled by an electric actuated air cylinder, the cylinder shall be large enough to assure positive opening and closing of the valve. The control shall be located on the

left pump panel, properly labeled as its function and feature a “green” valve open and “red” valve closed indicator light.

A 3" stainless steel Techno-Check one way full flow check valve shall be provided in the tank suction line to prevent back flow to the tank.

Tank Fill 2” Akron Valve

One (1) manually operated 2” Akron valve shall be installed between the pump discharge and the booster tank in order to fill the tank. The valve control shall be located at the pump operator’s panel and shall visually indicate the position of the valve at all times.

The valve shall be an Akron 8800HD series with a 316 stainless steel ball and dual polymer seats for ease of operation and increased abrasion resistance. The valve shall have a self-locking ball feature using an automatic friction lock design to balance the stainless steel ball when in a throttle position and water is flowing through it. The valve shall be of the unique Akron swing-out design to allow the valve body to be removed for servicing without disassembling the plumbing.

Rear Direct Tank Fill 2.5” Akron Valve

One (1) 2.5" Akron 8800HD series tank fill valve with a 316 stainless steel ball and dual polymer seats for ease of operation and increased abrasion resistance shall be provided. 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. Valve shall be controlled at the valve with “TSC” style handle with 2-1/2" NH male threads, inlet screen, and a chrome cap and chain shall be provided. The valve shall be located on the left side lower rear body panel.

Left Intake 2.5” Akron Valve

One (1) 2-1/2” suction inlet with a manually operated 2-1/2” Akron valve shall be provided on the left side pump panel. The valve shall be an Akron 8800HD series with a 316 stainless steel ball and dual polymer seats for ease of operation and increased abrasion resistance. The valve shall have a self-locking ball feature using an automatic friction lock design to balance the stainless steel ball when in a throttle position and water is flowing through it. The valve shall be of the unique Akron swing-out design to allow the valve body to be removed for servicing without disassembling the plumbing.

The outlet of the valve shall be connected to the suction manifold of the pump with the valve body located behind the pump panel. The valve shall come equipped with a brass inlet strainer, 2-1/2” NST female chrome inlet swivel and shall be equipped with a chrome plated, rockerlug plug with a retainer device.

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.

A 3/4" bleeder valve assembly will be installed on the left side pump panel.

Back Pump Tank Fill

A 3/4" valved outlet shall be provided on the left side pump operator`s panel for filling fire fighter back-pack pump tanks directly from the water tank. The valve plumbing shall be 3/4" I.D. properly routed from the tank sump to the filler valve control.

Discharge Left Panel 2.5" Akron Droop

One (1) 2-1/2" discharge outlet with a manually operated Akron valve shall be provided at the left hand side pump panel. The valve shall be an Akron 8800HD series with a 316 stainless steel ball and dual polymer seats for ease of operation and increased abrasion resistance. The valve shall have a self-locking ball feature using an automatic friction lock design to balance the stainless steel ball when in a throttle position and water is flowing through it. The valve shall be of the unique Akron swing-out design to allow the valve body to be removed for servicing without disassembling the plumbing.

The valve control shall be located at the pump operator panel and shall visually indicate the position of the valve at all times. The discharge shall extend out beyond the pump panel with a 30 degree downward angle with 2-1/2" NST threads to help prevent kinking of the discharge hose. The 30 degree droop shall be removable type and shall be equipped with a chrome plated rocker-lug cap with a retainer chain.

The discharge shall be supplied with a 3/4" bleeder valve assembly. The drain shall be controlled with a quarter-turn valve on the pump panel.

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

Discharge Left Rear 2.5" Akron Droop

One (1) 2-1/2" discharge outlet with a manually operated Akron valve shall be provided at the left rear of the body below the hosebed. The valve shall be an Akron 8800HD series with a 316 stainless steel ball and dual polymer seats for ease of operation and increased abrasion resistance. The valve shall have a self-locking ball feature using an automatic friction lock design to balance the stainless steel ball when in a throttle position and water is flowing through it. The valve shall be of the unique Akron swing-out design to allow the valve body to be removed for servicing without disassembling the plumbing.

The valve control shall be located at the pump operator panel and shall visually indicate the position of the valve at all times. The discharge shall extend out beyond the pump panel with a

30 degree downward angle with 2-1/2" NST threads to help prevent kinking of the discharge hose. The 30 degree droop shall be removable type and shall be equipped with a chrome plated rockerlug cap with a retainer chain.

The discharge shall be supplied with a 3/4" bleeder valve assembly. The drain shall be controlled with a quarter-turn valve on the pump panel.

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

2" Right Rear Discharge

One (1) 2" Akron 8800HD series valve 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. Valve shall be controlled at the valve with "TSC" style handle with 1-1/2" NH male threads, and a chrome cap and chain shall be provided. The valve shall be located below the hose bed on the right side upper rear body panel.

(2) 2" Crosslay Discharges

(2) 2" Akron 8800HD series valves with 316 stainless steel balls and dual polymer seats for ease of operation and increased abrasion resistance shall be provided. The valves 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 controls shall be located at the left and right side pump operator panels to the rear of the crosslay and shall visually indicate the position of the valve at all times.

Booster Hose Reel

One (1) Hannay SBEPF-17-28-29 12 volt DC electric rewind hose reel, latest edition (no substitute), with a 1" Akron 8800 series (or equal), 1/4 turn full flow ball valve with "TSC" style handle, brake, 2/3rd hp/imp high torque motor, w/70 amp circuit protection, constant duty relay and a stainless steel hub assembly (manifold) with 1" NPT hose fittings shall be provided. The reel shall be polished aluminum and the rewind buttons shall be located on the left and right pump operator's panels and be properly labeled.

The hose reel shall be installed on the left side of the apparatus above the pump operator's panel. The hose reel shall be the size to carry 150' of 3/4" hardline, or 100' of 1" hardline. The hardline hose is not included. The hose reel shall feature two horizontal and two vertical chrome fairlead rollers. The top and bottom horizontal rollers shall be backed up with a 5/16" steel rod to prevent the roller mounts from spreading.

Two (2) additional fairlead rollers shall be located on the auxiliary pump cover (if specified) for guiding the hose across the top of the vehicle. The hose reel assembly and wiring harness shall

be installed in such a manner as to be easily removable to gain access to various components below and behind the pump panel.

Thermal Relief Valve

A Hale TRVL-120 thermal relief valve shall be provided.

The valve shall help protect the pump by automatically monitoring pump water temperature. The relief valve shall automatically dump a controlled amount of water to the ground when the pump water exceeds the pre-set temperature of the relief valve.

A pump panel mounted indicator shall be installed at the pump operator`s panel.

Auxiliary Engine Cooler

An auxiliary engine cooler shall be provided to lower the engine coolant temperatures during prolonged pumping operations.

This auxiliary engine cooler shall be provided by the chassis manufacturer and installed in-line with the engine coolant system in such a manner as to allow cool pump water to circulate around engine coolant, thus forming a true heat exchanger action.

The auxiliary cooler inlet and outlet shall be continuous and shall prevent intermixing of engine coolant and pump water.

The auxiliary cooler shall be controlled at the pump operator`s panel.

FRC PumpBoss Pressure Governor

Fire Research PumpBoss model PBA400 series pressure governor and monitoring display kit shall be installed. The standard kit shall include a control module, pump discharge pressure sensor, and cables. The control module case shall be waterproof and have dimensions not to exceed 6-3/4" high by 4-5/8" wide by 1-3/4" deep. Inputs for engine information shall be from a J1939 databus or from independent sensors and pump discharge pressure input shall be from a pressure sensor.

The following continuous displays shall be provided:

- * CHECK ENGINE and STOP ENGINE warning LEDs.
- * Engine RPM; shown with four daylight bright LED digits more than 1/2" high.
- * Engine OIL PRESSURE; shown on an LED bar graph display in 10 psi increments.
- * Engine TEMPERATURE; shown on an LED bar graph display in 10 degree increments.
- * BATTERY VOLTAGE; shown on an LED bar graph display in 0.5 volt increments.
- * PSI / RPM setting; shown on a dot matrix message display.
- * PSI and RPM mode LEDs.
- * THROTTLE READY LED.

A dot-matrix message display shall show diagnostic and warning messages as they occur. It shall show monitored apparatus information, stored data, and program options when selected by the operator.

The program shall store the accumulated operating hours for the pump and engine, previous incident hours, and current incident hours in a non-volatile memory. Stored elapsed hours shall be displayed at the push of a button. It shall monitor inputs and support audible and visual warning alarms for the following conditions:

- * Low Oil Pressure
- * High Engine Coolant Temperature
- * High Transmission Temperature
- * Low Battery Voltage (Engine Off)
- * Low Battery Voltage (Engine Running)
- * High Battery Voltage
- * High Engine RPM

The governor shall operate in two control modes; pressure and RPM. No discharge pressure or engine RPM variation shall occur when switching between modes. A control knob that uses optical technology shall adjust pressure or RPM settings. It shall be 2" in diameter with no mechanical stops, a serrated grip, and have a red idle push button in the center.

A throttle ready LED shall light when the pump engaged interlock signal is recognized. The governor shall be in pressure mode and set the engine RPM to idle. In pressure mode the governor shall automatically regulate the discharge pressure at the level set by the operator. In RPM mode the governor shall maintain the engine RPM at the level set by the operator except in the event of a discharge pressure increase. The governor shall limit a discharge pressure increase in RPM mode to a maximum of 30 PSI. Other safety features shall include recognition of no water conditions with an automatic programmed response and a push button to return the engine to idle.

The pressure governor and monitoring display shall be programmed to interface with a specific engine.

The display module shall be mounted at the pump operator's panel.

Anode, Darley Pump

An anode to help prevent damage caused by galvanic corrosion within the pump shall be provided. The system provides a sacrificial metal which helps to diminish or prevent pump and pump shaft galvanic corrosion. One (1) anode will be located on the suction side of the pump

Class 1 Pump Test Ports

Class 1 test taps for pump intake and pump pressure shall be provided on the pump panel and be properly labeled.

Pump Panel Air Outlet

A 1/4 inch female AmFlo C30 air hose fitting shall be mounted on the driver pump panel with a 1/4 inch valve. The fitting and valve shall be connected to the air reservoir tank.

Ferrell Compression Fittings

Ferrell compression fittings shall be supplied and installed on all pump plumbing.

Pump Panel Tags

Color coded pump panel labels shall be supplied to be in accordance with NFPA 1901 compliance.

Pump Certification Non NFPA

The fire pump shall be tested after the pump and all its associated piping and equipment have been installed on the apparatus. The tests shall be conducted at the manufacturer`s approved facility and certified by the body manufacturer. The certification shall include the pump test, pressure control system test, priming device tests, vacuum test and water tank to pump flow test.

The pump shall deliver the percentage of rated capacities at pressures indicated below:

100% of rated capacity at 150 psi net pump pressure
70% of rated capacity at 200 psi net pump pressure
50% of rated capacity at 250 psi net pump pressure

A Certificate of Inspection certifying performance of the pump and all related components shall be provided at time of delivery. Additional certification documents shall include, but not limited to, Certificate of Hydrostatic Test, Electrical System Performance Test, Manufacturer`s Record of Pumper Construction, and Certificate of Pump Performance from the pump manufacturer.

PUMP OPTIONS

Pump Primer

AUTOMATIC FIRE PUMP PRIMING SYSTEM

A Trident Model #31.013.5 automatic air operated priming system shall be installed. The unit shall be of all brass and stainless steel construction and designed for fire pumps of 1,000 GPM (3,750 LPM) or less. Due to corrosion exposure no aluminum or vanes shall be used in the primer design. The primer shall be two-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.

Performance, Safety, and NFPA Compliance

The priming system shall be capable to a vertical lift to 22 inches of mercury and shall be fully compliant to applicable NFPA standards for vertical lift. 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 13.2 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.

Automatic Primer Control and Vacuum Gauge Panel

The 12 volt primer control shall be an "automatic" type, with a pump panel three-way switch to operate an air solenoid valve. The air valve shall direct air pressure from the air brake system to the primer. To prevent freezing, no water shall enter the primer valve control.

A vacuum gauge 2" in diameter, with graduations from zero to 30 feet, shall be installed in the primer control panel. The gauge shall be physically connected to the vacuum side of the primer and read only when the primer is running so it will never see or be subject to damage from high pump intake pressures.

The automatic priming switch shall have three positions as follows:

- **"Prime"** – the lower position shall be a momentary "push to prime". The "Prime" position also allows the operator to "ramp" test the primer without the fire pump being engaged.
- **"Off"** -- center position
- **"Auto-Prime"** – in the upper position, a "green" LED pilot light shall be illuminated when the switch is the auto-prime position. The "Auto-Prime" operates automatically when the pump pressure drops below 20 PSIG. The primer shuts "off" automatically when the pump pressure is re-established and exceeds 20 PSIG. The "Auto" mode only operates when the fire pump is engaged.

Power Requirements

To reduce the electrical power requirements on the fire apparatus the priming system shall be air powered. The system shall not require annual tear-down and maintenance, an electric motor, lubrication, belt drive, or clutch assembly. The maximum current draw shall not exceed 0.5 amps during operation.

Warranty

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

DISCHARGES AND PRECONNECTS

Front Jump Line 1.5 Akron Valve [Qty: 2]

One (1) 1-1/2" preconnect outlet with a manually operated Akron valve shall be supplied to the extended front bumper. The preconnect shall consist of a 2" heavy duty hose coming from the pump discharge manifold to a 2" FNPT x 1-1/2" MNST mechanical swivel hose connection to permit the use of the hose from either side of the apparatus.

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.

An air blow-out valve shall be installed between the chassis air reservoir and the front jump line. The control shall be installed on the pump operator's panel.

The discharge shall be supplied with a Class 1 automatic 3/4" drain valve assembly. The automatic drain shall have an all-brass body with stainless steel check assembly. The drain shall normally be open and automatically close when the pressure is greater than 6 psi.

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

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

Swivel Front Jump Line Brass

There shall be a brass swivel provided for the front bumper discharge located on top of bumper driver's side of center tray, officer's side of center tray.

GAUGES

Tank Level Gauge Mini Water

A Fire Research TankVision model WLA205-A00 miniature tank indicator shall be installed in the cab center console. The indicator shall show the volume of water in the tank on five (5) easy to see super bright LEDs. A wide view lens over the LEDs shall provide for a viewing angle of 180 degrees. The indicator case shall be manufactured of aluminum and have a distinctive blue label. The miniature indicator shall receive input information over a single wire from a Fire Research TankVision model WLA200-A00 tank primary indicator.

FRC Water Tank Level Gauge

Fire Research TankVision Pro model WLA300-A00 tank indicator kit shall be installed. The kit shall include an electronic indicator module, a pressure sensor, and a 10' sensor cable. The indicator shall show the volume of water in the tank on nine (9) easy to see super bright RGB LEDs. A wide view lens over the LEDs shall provide for a viewing angle of 180 degrees. The indicator case shall be waterproof, manufactured of Polycarbonate/Nylon material, and have a distinctive blue label.

The program features shall be accessed from the front of the indicator module. The program shall support self-diagnostics capabilities, self-calibration, six (6) programmable colored light patterns to display tank volume, adjustable brightness control levels and a datalink to connect remote indicators. Low water warnings shall include flashing LEDs at 1/4 tank, down chasing LEDs when the tank is almost empty, and an output for an audio alarm.

The indicator shall receive an input signal from an electronic pressure sensor. The sensor shall be mounted from the outside of the water tank near the bottom. No probe shall be placed on the interior of the tank. Wiring shall be weather resistant and have automotive type plug-in connectors.

FRC Tank Level Gauge Water Additional

Fire Research TankVision Pro model WLA300-B00 tank remote indicator kit shall be installed. The kit shall include an electronic indicator module and a 10' remote cable. The indicator shall show the volume of water in the tank on nine (9) easy to see super bright RGB LEDs. A wide view lens over the LEDs shall provide for a viewing angle of 180 degrees. The indicator case shall be waterproof, manufactured of Polycarbonate/Nylon material, and have a distinctive blue label.

The remote indicator shall receive input information over a datalink from a Fire Research TankVision primary indicator model WLA200-A00, WLA300-A00 or WLA400-A00. It shall mirror the primary indicator. A 10' cable shall be provided to connect the datalink. The remote indicator shall have the same program as the primary so that the two indicators are interchangeable.

Shall be located driver rear.

FOAM SYSTEMS

Foam System

There shall be a FoamPro 1600 fully automatic electronic direct injection foam proportioning system furnished and installed on the fire pump/CAFS assembly. The system shall be capable of Class A foam concentrates only. The proportioning operation shall be based on an accurate direct measurement of water flow with no restriction. The proportioning system shall meet NFPA standards for foam proportioning systems and the design shall have passed testing against SAE automotive reliability standards appropriate for the application. The foam system shall be installed in accordance with the manufacturer recommendations.

Controls shall be installed on the pump operator`s panel and enable the pump operator to perform the following control and operation functions:

- Activate the foam system.
- Change foam concentrate proportioning rates from .1% to 1% in .1% increments.
- Feature a "low concentrate" warning indicator.

The foam system shall have a 12 volt, 3/4 hp "TENV" electric motor designed for wet and high humidity environments, direct coupled to a positive displacement piston type foam concentrate pump with a rated capacity of 1.7 gpm @ 200 psi (6.4 L/min@13.8 BAR) with maximum operating pressures up to 400 psi (27.6 BAR).

ELECTRICAL SYSTEMS

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.

Electrical Connection Protection

The vehicle electrical system shall be made more robust by the application of a corrosion inhibiting spray coating on all exposed electrical connections on the body.

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

Data Recorder

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

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

- Time 24 hour time
- Date Year/Month/Day

Occupant Detection System

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

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

The visual warning shall consist of a graphical display that will continuously indicate the validity of each seat position.

The system shall include a display panel with LED back-lit ISO indicators for each seating position, seat sensor and safety belt latch switch for each cab seating position, audible alarm and braided wiring harness.

The display panel shall be located center console.

NFPA 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.

Multiplex Display

The V-MUX multiplex electrical system shall include a display module (Information Center). The display shall be programmed to show door ajar status and diagnostic information in text format.

The display shall have the following features:

- LCD technology
- Four (4) twenty (20) character lines
- Six (6) input / navigation buttons
- Rugged aluminum housing

The display shall be located in the cab dash.

Electrical Connection Protection

The vehicle electrical system shall be made more robust by the application of a corrosion inhibiting spray coating on all exposed electrical connections on the body.

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

Battery Charger / Inlet Receptacle

A Kussmaul 1000 PLC 15A battery charger with bar graph display shall be provided to maintain batteries. The charger shall be power supplied by a Kussmaul 20A auto-eject inlet receptacle with a yellow cover. Inlet receptacle shall be located on the driver side of the chassis trim package.

Master Battery Disconnect

A master battery disconnect shall be provided inside the commercial chassis cab as dictated by Engineering design.

USB Charging Port

A dual USB charging port for cell phones, chargers, etc. shall be installed one (1) each side at lower rear console and one (1) each side at front lower console. The receptacles shall be wired battery hot.

12 Volt Outlet

Two (2) plug-in type receptacle for handheld spotlights, cell phones, chargers, etc. shall be provided. The receptacle shall be wired battery hot. The outlets shall be located on the rear cab console.

12 Volt Power Lead

One (1) 12 volt/12 gauge/10 amp constant hot lead shall be provided. The lead shall be 24" long and include a ground wire and fuse.

The lead shall be located in the center console.

12V Power Lead

One (1) 12 volt 12 gauge wired through ignition lead shall be provided. The lead shall be 24" long and include a ground wire and fuse.

The lead shall be located in the center console.

Air Horn Switch

A heavy duty, weatherproof, push button switch shall be installed at the driver side pump operator`s panel to operate the air horns.

The switch shall be labeled "Air Horn".

Back-Up Alarm

An Ecco electronic back-up alarm model SA917 shall be supplied. The self-adjusting 87-112 dB(A) alarm shall be wired into the chassis back-up lights to signal when the vehicle is in reverse.

License Plate Light

One (1) Truck-Lite model 15905 white LED license plate light mounted in a Truck-Lite model 15732 chrome plated plastic license plate housing shall be mounted at the rear of the body.

Body Marker Lights

TecNiq 3/4" LED grommet clearance lights shall be installed as specified.

Upper Body:

- One (1) red LED clearance light each side at rear of body, rear facing.
- One (1) red LED clearance light each side at rear of body, side facing.

Lower Body:

- Three (3) red LED clearance lights centered at rear.
- One (1) red LED clearance light side facing at the trailing edge on either side of the apparatus body.
- One (1) amber LED clearance light side facing at front of body (or pump module as applicable).
- One (1) amber LED auxiliary turn light side facing at front of body (or pump module as applicable).

Taillights

Three (3) Trucklite 4400 series 4" circular LED (Light Emitting Diode) taillights shall be installed each side at the rear of the apparatus.

Light functions shall be as follows:

- Red stop/taillight in upper position
- Red turn signal middle position
- Clear back-up light in lower position.

The lights shall be in resilient shock absorbent mount for improved life.

The wiring connections shall be made with a weather resistant plug-in style connector.

LED Pump Panel Light Package

Three (3) TecNiq model E10 LED lights shall be mounted under a light shield directly above each side pump panel. A weatherproof toggle switch on the driver side pump panel shall activate the lights when the park brake is set.

Light Wiring

Center pump panel light at the pump operator`s panel shall be wired to the pump shift to provide pump panel illumination when the pump is placed into gear.

Compartment Light Package

Two (2) TecNiq E45 LED compartment light strip shall be mounted in each body compartment greater than 4 cu. ft. Transverse compartments shall have four (4) lights, located two (2) each side of the body.

Each light bar shall include super bright white LEDs mounted to circuit boards encapsulated in an aluminum extrusion using TecSeal with TPE sealed end caps. The lights shall produce approx. 300 lumens per foot and shall be provided with a limited lifetime warranty.

Compartment lights shall be wired to a master on/off switch located in the cab.

The wiring connection for the compartment lights shall be made with a weather-resistant plug in style connector. A single water and corrosion-resistant switch with a polycarbonate actuator and sealed contacts shall control each compartment light. The switch shall allow the light to illuminate if the compartment door is open.

Door Ajar Switches

The apparatus body shall have magnetic door ajar switches.

Hose Bed Lights

Four (4) Tecniq E45 LED light strips shall be provided to illuminate the hosebed areas. The strip type lights shall be located one (1) each of the hosebed sides directed toward the center of the hosebed, to provide hose bed lighting per current NFPA 1901.

The hose bed light shall be activated with magnetic door ajar switch on each hosebed cover.

Ground Lights

Four (4) TecNiq model T440 4" circular LED (Light Emitting Diode) with clear lenses mounted in a resilient shock absorbent mount for improved bulb life shall be provided. Lights shall be mounted one (1) side below the cab and one (1) each side below the pump module running boards. The wiring connections shall be made with a weather resistant plug in style connector.

Pump module lights shall be activated from a driver side pump panel mounted weatherproof toggle switch.

Lights in areas under the driver and crew area exits shall be activated automatically when the exit doors are opened.

WARNING LIGHT PACKAGES

Warning System

Light Bar

A Whelen Justice series 56" model JY-CALFIRE all LED light bar with clear lenses shall be installed centered on the front cab roof. The light bar shall consist of two (2) front corner facing LIN6 red LED modules, two (2) rear corner facing LIN6 red LED modules, eight (8) forward facing CON3 Linear LED modules (six (6) red / two (2) white), two (2) forward facing LR11 LED takedown lights, two (2) side facing LR11 alley LED lights and MKEZ7 mounts. One (1) forward facing red LED module shall be provided as steady burn.

The white LEDs shall be switched off in blocking right of way mode.

Upper Level Warning

Two (2) Whelen M6K split red/amber Linear Super LED light heads with clear lens shall be provided. The lights shall include chrome flanges where applicable. Lights shall be located one (1) each side rear facing on the upper body panels.

Two (2) Whelen M6V2RC Super LED red light heads with clear lens shall be provided. The rectangular lights shall include chrome flanges where applicable. Scene lights shall be provided a switch in the cab. Lights shall be located one (1) each side (side facing) on the upper rear body panels.

Lower Level Warning

Two (2) Whelen WIONR series universal mounted Super LED red light heads with clear lenses and chrome flanges shall be provided. Lights shall be located one (1) each side front bumper facing forward.

Two (2) Whelen M6RC red Linear Super LED light heads with clear lens shall be provided. The lights shall include chrome flanges where applicable. Lights shall be located one (1) each side front grille.

Two (2) Whelen M6RC red Linear Super LED light heads with clear lens shall be provided. The lights shall include chrome flanges where applicable. Lights shall be located one (1) each side (side facing) on the front bumper extension.

Two (2) Whelen M6RC red Linear Super LED light heads with clear lens shall be provided. The lights shall include chrome flanges where applicable. Lights shall be located one (1) each side above rear wheel wells.

Two (2) Whelen M6RC red Linear Super LED light heads with clear lens shall be provided. The lights shall include chrome flanges where applicable. Lights shall be located one (1) each side rear facing below taillights.

Directional Light Bar

One (1) Whelen model TADP8 LED Dominator™ Plus Traffic Advisor™ with clear lenses shall be provided at the rear of the body in a recess mount. The light bar shall include eight (8) LINZ6™ Super-LED® amber lamps. The lightbar shall be controlled through the Whelen siren head.

Alternating Headlights

A Federal Signal model FHL2-SC headlight flasher shall be provided. The flasher shall alternately flash the headlights at a rate of 90fpm and shall be controlled by siren head switch.

Door Ajar Light/Alarm

There shall be a 2" red LED hazard light installed in the cab. A door ajar alarm shall sound when the light is activated.

Siren

One (1) Whelen Cencom Carbide model CCSRN4A siren head shall be provided on the cab console. The siren shall feature eight (8) switches, three (3) position slide switch, directional light bar control and rotary knob with seven (7) siren modes. The switches shall be wired and labeled: Right Alley, Take Down, Left Alley, Flood Rear, Scene Rear, Scene Left, Scene Right, Wig Wag.

Siren Speaker

One (1) Whelen model SA315P 100 watt speaker shall be provided behind a cut-out in the front bumper. The speaker shall have a nylon composite black housing with front loaded, powder coated speaker driver. The speaker shall produce a minimum sound output of 120 dB at 10 feet to meet current NFPA 1901 requirements.

WARNING LIGHTS

Opticom Emitter

A GTT 794H LED Opticom emitter light head shall be installed driver's side brow.

LIGHTS - DECK AND SCENE

Scene Lights

Two (2) FireTech model FT-GESM, Guardian Elite LED Surface Mount scene lights with chrome flanges (when required) shall be provided.

Part #: FT-GESM

Voltage Range: 9-32 V DC

Total Amperage @ 12V DC: 10.42

RAW Lumens: 20,500

Effective Lumens: 12,290

Lights shall be located (1) each side of body rear facing up high, (1) each side of body side facing upper forward and switched in cab (side facing lights switched separately).

CAMERAS / INTERCOM

360 Camera System

A FRC inView 360 HD camera system shall be installed on the apparatus. The system shall feature four (4) ultra wide-angle cameras located on the front, sides and rear of the vehicle. A control module shall be provided that shall take the simultaneous digital images from the cameras and process them (video stitch) into a single 360° birds-eye view image. The system shall automatically switch to a camera / area specific priority based on inputs from reverse, right turn, left turn and park brake. The video image shall be displayed on a 7" color monitor viewable by the driver. A button shall be provided on the dash to allow view selection. The camera system shall have a built in DVR for use with department supplied SD card(s). The camera system shall be capable to hold up to four (4) 256 GB SD cards for a total storage of one (1) TB.

Communications Equipment

Intercom System

A Sigtronics intercom system shall be provided with four (4) jacks in the cab.

One (1) Model US-45S ultrasound voice activated intercom system shall be provided in the cab. Interior headset plug-in modules and hanger hooks shall be provided for each of the seated locations. Driver and officer plug-in locations shall be provided with a push to talk module.

Headsets shall be ordered separately and are not included as part of the Intercom package.

Antenna Base

There shall be four (4) Tessco P/N 90942 universal antenna base mounted on the cab roof with a weatherproof connector. The antenna bases shall be NMO Motorola Style (equivalent to a MATM style) with RG58U coax cable. The antennas shall be located one (1) each side at rear corners of roof and one (1) each side approximately 24" forward of rearward antenna.

Coax cable shall be routed to behind the officer seat.

VHF Speaker

One (1) VHF speaker shall be provided. The speaker shall be installed in a fabricated housing centered on the ceiling above the center console. Speaker wire shall be routed to the center console with an 8' service loop.

Radio Amp Housing

A cover constructed of 1/8" (.125") diamond plate shall be provide behind the officer seat to protect the customer installed radio amplifier. Cover shall be designed to allow air flow for cooling of amp.

LIGHTS - AREA

LED Flood Light

One (1) FireTech 12V LED bracket mounted mini-brow flood light model FT-MB-21-FT-B 27" long shall be provided. The light shall feature 21 LEDs` producing 7,762 usable lumens. The 105W 12V light shall draw 8.75 amps. A switch shall be provided, accessible to driver, for activation of light.

The light assembly shall be located on cab/bumper as specified.

MISC LOOSE EQUIPMENT

DOT Required Drive Away Kit

Three (3) triangular warning reflectors with carrying case shall be supplied to satisfy the DOT requirement.

EXTERIOR PAINT

Paint/Lettering/Graphics

Paint

The apparatus body panels shall be painted Sikkens FLNA 2303 red. The paint process shall meet or exceed current state regulations concerning paint operations. Pollution control shall include measures to protect the atmosphere, water, and soil. Contractor shall, upon demand, provide evidence that the manufacturing facility is in compliance with State EPA rules and regulations.

The aluminum panels shall have no mounted components prior to painting to assure full coverage of metal treatments and paint to the exterior surfaces of the body. Any vertically or horizontally hinged smooth-plate compartment doors shall be painted separately to assure proper paint coverage on body, door jambs and door edges.

Paint process shall feature Sikkens high solid LV products and be performed in the following steps:

- Corrosion Prevention - all aluminum surfaces shall be pre-treated with the Alodine 5700 conversion coating to provide superior corrosion resistance and excellent adhesion of the base coat.
- Sikkens Sealer/Primer LV - acrylic urethane sealer/primer shall be applied to guarantee excellent gloss hold-out, chip resistance and a uniform base color.
- Sikkens High Solid LVBT650 (Base coat) - a lead-free, chromate-free high solid acrylic urethane base coat shall be applied, providing excellent coverage and durability. A minimum of two (2) coats shall be applied.
- Sikkens High Solid LVBT650 (Clear coat) - high solid LV clear coat shall be applied as the final step in order to ensure full gloss and color retention and durability. A minimum of two (2) coats shall be applied.

Any location where aluminum is penetrated after painting, for the purpose of mounting steps, handrails, doors, lights, or other specified components shall be treated at the point of penetration with a corrosion inhibiting pre-treatment (ECK Corrosion Control). The pre-treatment shall be applied to the aluminum sheet metal in all locations where the aluminum has been penetrated. All hardware used in mounting steps, handrails, doors, lights, or other specified components shall be individually treated with the corrosion inhibiting pre-treatment.

After the paint process is complete, the gloss rating of the unit shall be tested with a 20 degree gloss meter. Coating thickness shall be measured with a digital MIL gauge and the orange peel with a digital wave scan device.

Striping

A triple white non-straight Scotchlite stripe, 1/4/1 inches in width shall be installed on the cab and body. The stripe shall be NFPA compliant and the location shall be as specified by the customer.

Alternating red/white reflective striping shall be provided on the perimeter of all compartment doors and front face of all shelving.

Red/Yellow printed reflective chevron striping shall be provided on the full rear of the body.

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) Ten (10) Years or 100,000 Miles limited warranty in accordance with, and subject to, warranty certificate RFW0502. The warranty certificate is incorporated by reference into this proposal, and included with this proposal or available upon request.

Plumbing and Piping (Stainless Steel) Warranty

Purchaser shall receive a Plumbing and Piping (Stainless Steel) Ten (10) Years or 100,000 Miles limited warranty in accordance with, and subject to, warranty certificate RFW0800. 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 Warranty

Purchaser shall receive a Paint and Finish Ten (10) Years limited warranty in accordance with, and subject to, warranty certificate RFW0710. 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.

Fire Apparatus Safety Guide

Fire Apparatus Safety Guide published by FAMA, latest edition. This safety manual is intended to point out some of the basic safety situations that may be encountered during the normal operation and maintenance of a fire apparatus and to suggest possible ways of dealing with these situations. This manual is **NOT** a substitute for the E-ONE`s fire apparatus operator and maintenance manuals or commercial chassis manufacturer`s operator and maintenance manuals.