Bryan County Emergency Services
Post Office Box 430,
Pembroke Georgia, 31321
(912) 858-2799 Office (912) 858-2599 Fax
http://www.bryancountyga.org/

Desired Specifications

BRYAN COUNTY
REQUEST FOR PROPOSAL

Three (3)
1500 GPM/1000 Gallon Tank Pumper

Bryan County Emergency Services

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Pembroke Georgia, 31321
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NFPA 1901-2016

The National Fire Protection Association "Standard for Automotive Fire Apparatus, 2016 Edition, is hereby adopted and made a part of these desired specifications, the same as if it were written out in full detail, with the exception of the section dealing with "Equipment Recommended for Various Types of Apparatus".

APPARATUS ATTRIBUTES

PAINT

CAB EXTERIOR
Single Color Red

BODY PAINT
Color Body Panels Color: Red
If the hose bed sides are painted are they the same color as the body panels? Yes

FRAME RAILS

Color Painted Frame Color: * Galvanized
Color Painted Frame Code: * NA
*Unless noted elsewise the cab lower color will be used when painted rails are selected.

ORDER CONFIRMATION

Details of construction such as, but not limited to mounting positions for siren heads, grab handles, switches, labeling and materials where not otherwise specifically detailed in the written specifications at time of order, shall be left to the discretion of the as the manufacturer who shall be solely responsible for the design, construction and placement of the components.

A drawing shall be provided as part of the order confirmation. The drawing is an overall representation of the apparatus proposed and not an exact representation of the apparatus to be built. The exact locations of accessories and/or components may be revised pending complete engineering of the custom requirements of the individual apparatus order. If there is a discrepancy between the drawing and the written order confirmation; the specifications within this order confirmation prevail.

CUSTOM CHASSIS
The chassis shall be designed and manufactured by the apparatus builder in the manufacturer's facility. The manufacturer shall demonstrate evidence of manufacturing similar custom vehicles for at least fifty (50) years.

Bids shall only be accepted from a single source apparatus manufacturer. The definition of single source shall be "a manufacturer that designs and manufactures their products using an integrated approach, including the cab and chassis, pump module, apparatus body and aerial device being fabricated and assembled on the bidder's premises". The warranties relative to the chassis, apparatus body and aerial device (excluding component warranties such as engine, transmission, axles, pump, etc.) must be from a single source manufacturer and not split between manufacturers (i.e. body and chassis). The bidder shall provide evidence that they comply with this requirement. No exceptions will be permitted to this section of the document.

The chassis shall be designed and manufactured for heavy duty fire service with adequate strength and capacity for all components as detailed within these specifications.

CHASSIS FRAME

The frame shall be designed to industry standards. The manufacturer shall provide a life time frame side rail warranty to the original purchaser of the chassis. The frame rails shall be 10.5" x 3.5" x .375" heat treated steel.

The frame side rails shall be 110,000 psi minimum yield and shall have a minimum section modulus of 18.34 cu. in. calculated by using the square corner shape method. The resulting frame rail resistance to bending moment shall be 2,017,400 in. lb. per rail.

To insure the maximum clamp load for the fastener prevailing torque the cross members shall be bolted in place using grade 8 bolts, hardened washers, and grade C distorted thread locknuts. Flanged head fasteners shall not be acceptable. The top of the frame rails shall be free of bolt heads.

Frame engine cutouts shall be made with a plasma torch to minimize the heat affected zone of the cut. All cutouts shall have a minimum of 6-inch transitions between rail flange cut depths to reduce the stress concentrations throughout the cutout area. The root of all transition areas shall have a minimum of a 2-inch radius to reduce stress concentrations at the root.

The main frame rails and main frame cross members behind the pump shall galvanized to reduce the effect of harsh road chemicals. This warranty shall be in effect for 20 years after delivery of the apparatus to the end user.

CAB MAIN FRAME CROSSMEMBER

In addition to the rear cab support cross member there shall be a main frame cross member mounted in the rear cab area. This cross member shall be a wide base flanged design to provide frame spacing and excellent strength to prevent frame paralleling. Every frame cross member shall be bolted in place using grade 8 bolts, hardened washers, and grade "C" distorted thread locknuts.

FRONT AXLE

The front axle shall be a MERITOR model "MFS-18-133A-N" with a 18,740 lb. capacity.

CRAMP ANGLE

The chassis shall have a turning cramp angle of 52-degrees. Both left and right turns have a full 52° cramp angle with tires and wheels mounted on the axle and installed in the chassis. The 52°cramp angle is achieved irrespective of options such as front suctions and disc brakes.

FRONT AXLE OIL SEALS

The front axle shall be equipped with oil bath type oil seals as supplied on the axle from the axle manufacturer. The spindles shall be equipped with transparent covers for oil level inspection.

FRONT AXLE BRAKES

The front brakes shall be Cam-Master Q Plus, 16-1/2" X 6" (419 x 152), S-Cam, air operated heavy-duty brakes for increased stopping power and brake life in severe braking applications.

The "S" cam brakes shall incorporate a double anchor pin design, for stability and smooth consistent stopping. The camshafts shall be heat treated with rolled spline construction.

The front axle shall be equipped with automatic slack adjusters (ASA) to provide optimum brake performance.

FRONT SUSPENSION

The front suspension shall be a pin and shackle design. Front springs shall be a minimum of ten (10) leaf elliptical type, 53" x 3-1/2" x .499" forged steel. The front springs shall have a military wrapper for safe operation. For a smooth ride the spring rate shall not exceed 3,000 lbs./in deflection.

All front spring pins shall be ground heat treated steel with grease fittings for lubrication.

The entire front suspension shall be designed for heavy duty custom fire apparatus with a capacity at ground of 18,740 lbs. Double acting hydraulic shock absorbers are to be installed.

STEERING SYSTEM

The steering shall be equipped with a single SHEPPARD M110 integral power steering gear. The engine shall be equipped with a gear driven pump.

A remote steel reservoir shall be provided with the ability to check the fluid level when the cab is in the lowered position.

FRONT TIRES

The front tires shall be 315/80R22.5-20PR (L) GOODYEAR G-751 MSA all-weather tread, tubeless radial tires. These tires shall be mounted on 22.5" x 9.00" rims.

STANDARD LOAD RATING

The front axle GAWR using these tires shall be 18,180 lbs. @ 130 psi.

TIRE SPEED RATING

The maximum tire speed rating is 68 MPH.

ALUMINUM WHEELS

Two (2) polished aluminum wheels shall be supplied and installed on the front axle. The 22.5" x 9.00" wheels shall be highly polished on the outboard side.

WHEEL TREATMENT

The aluminum wheels shall be supplied with wheel treatment for a bright finish and wheel protection.

FRONT WHEEL TRIM

The front axle shall be trimmed with mirror finish, 304L grade, non-corrosive stainless steel 'baby moon' hub caps with an opening for viewing the oil seal cover, and bright finished nut covers.

SINGLE REAR AXLE

The rear axle shall be a MERITOR model "RS-25-160" with a 27,000# capacity for the fire service.

MERITOR DIFFERENTIAL

The rear axle shall contain a Meritor 160 Series differential with an 18-inch diameter ring gear utilizing hypoid-Generoid gearing and a 2-1/4-inch diameter axle shaft.

AXLE DIFFERENTIAL LUBE

The axle shall have the initial factory fill made with non-synthetic axle lube meeting the axle manufacturer's recommendations.

REAR AXLE OIL SEALS

The rear axle shall be equipped with premium oil bath type oil seals as supplied on the axle from the axle manufacturer.

REAR AXLE BRAKES

The rear brakes shall be Cam type, 16-1/2" X 7" (419 x 178), S-Cam, air operated heavy-duty brakes for increased stopping power and brake life in severe braking applications.

The "S" cam brakes shall incorporate a double anchor pin design, for stability and smooth consistent stopping. The camshafts shall be heat treated with rolled spline construction.

The rear axle shall be equipped with automatic slack adjusters (ASA) to provide optimum brake performance.

NFPA TOP SPEED STATEMENT

NFPA-1901, 2016 Edition - 4.15.2 The maximum top speed of fire apparatus with a GVWR over 26,000 lb. (11,800 kg) shall not exceed either 68 MPH (105 km/hr.) or the manufacturer's maximum fire service speed rating for the tires installed on the apparatus, whichever is lower. NFPA-1901, 2016 Edition - 4.15.3 If the combined water tank and foam agent tank capacities on the fire apparatus exceed 1250 gal (4732 L), or the GVWR of the vehicle is over 50,000 lb. (22,680 kg), the maximum top speed of the apparatus shall not exceed either 60 MPH (105 km/hr.) or the manufacturer's maximum fire service speed rating for the tires installed on the apparatus, whichever is lower.

The speed selected on this apparatus exceeds 60 MPH (105 km/hr.) and the customer is aware of NFPA-1901 and the top speed that will be achieved with the finished apparatus.

SINGLE AXLE REAR SUSPENSION

The rear springs shall be a minimum of seventeen (17) main including four (4) auxiliary leaves. The rear suspension shall have a rating of 27,000 lbs. Capacity. The rear suspension shall be a "self-leveling" slipper type with a main torque leaf that contains a military wrapper. The torque leaf shall contain a bronze bushing for long service life.

The rear hangers are to be of the slipper design. For a smooth ride the rear suspension deflection rate shall not exceed 3,790 lbs. per inch.

One (1) inch diameter rear suspension U-bolts are required.

Two (2) main frame cross members shall be mounted in the rear suspension area, bolted to the frame rail as a rear suspension support member. Each cross member shall be a wide base flanged design to provide frame spacing and excellent strength to prevent frame paralleling. Each cross member shall be bolted in place using grade 8 bolts, hardened washers, and grade "C" distorted thread locknuts.

AIR SYSTEM

An air brake system meeting the requirements of the FMVSS-121 shall be provided. The system shall consist of three (3) reservoirs with a 4,362-cu. in. volume. The air system shall consist of the following components:

Dual air system with dual gauges and a warning light and buzzer. A spring actuated parking brake built into the rear axle brakes with a manual control and warning light the in cab. These shall automatically apply in case of air system failure. A mechanical means of releasing the spring brake shall be provided in the event of total loss of air pressure.

A quick build up system shall be provided, capable of building enough air pressure to release the spring brake in less than thirty (30) seconds, when starting with the entire air system at zero pounds' pressure.

The brake system shall be a split system. One (1) system serving the rear brakes and one (1) system serving the front brakes. The two (2) systems shall be connected with a double check valve that shall automatically shuttle air from the front system to the rear system should loss of air pressure occur. This system shall also modulate the amount of air so the spring brakes shall apply in direct relationship to the amount of pressure applied to the treadle valve.

The brake system shall be equipped with a Bendix SR-7 valve to provide modulated spring brakes in the event there is low air pressure in the rear axle air supply reservoir.

The spring brakes shall be piped in such a manner that if the treadle valve is depressed while the spring brakes are applied, the spring brakes shall release and remain released as long as the treadle valve is depressed. They shall reapply immediately when the treadle valve is released.

The piping in the air system shall be 2-ply nylon reinforced color-coded tubing for all stationary lines.

AIR DRYER

The air system shall include a BENDIX AD-SP air dryer.

The air dryer shall have a spin off desiccant cartridge.

The air dryer shall incorporate an integral turbo cutoff valve. The turbo cutoff valve shall close the path between the air compressor and the air dryer purge valve during the compressor "unload" cycle. This shall allow the air dryer to purge the water and contaminates without any loss of turbo boost or engine horsepower.

A 12-volt heated moisture ejector shall be an integral part of the air dryer. This heater shall be thermo- statically controlled. The electrical connection for the heater shall use a sealed electrical connector to protect against moisture and corrosion.

MANUAL AIR TANK DRAINS

All air reservoirs shall have manual 1/4 turn drain valves. The drain valves shall be supplied with rubber seats to reduce air system leaks. The reservoir drain valves shall allow the accumulation of contaminants that are collected in the reservoirs to be drained off to the atmosphere.

MERITOR/ROCKWELL/WABCO ABS BRAKE SYSTEM

A four channel, single rear axle model, MERITOR/ROCKWELL/WABCO ABS Braking System shall be supplied.

A frame mounted electronic control unit (ECU) shall monitor and control wheel speed during braking. Wheel sensors, constantly monitoring wheel speed, send information to the ECU. If a wheel begins to lock the ECU transmits an electrical impulse to modulator valves that can apply, release or hold the air pressure in the brake chambers. The rapid modulation of air pressure prevents wheel lock-up and increases driver control.

This ABS system shall be a 4S/4M system with four (4) wheel speed sensors and four (4) modulator valves.

If a fault occurs in one wheel, that wheel shall have normal (non-ABS) brake function. The other wheels shall continue to provide the ABS function. If the ABS system should fail completely, the brake control shall be returned to normal (non-ABS) braking.

An ABS warning light shall be installed on the driver's dash message center. This warning light shall cycle through a test stage at the point of ignition turn on and remain illuminated until the vehicle reaches approximately four (4) MPH. The light shall illuminate in other conditions to warn of an ABS system failure and shall illuminate when the diagnostic function is activated.

DEEP MUD/SNOW SWITCH

Meritor/Rockwell/Wabco ABS shall be supplied with deep mud and snow switch. This switch shall increase the ATC threshold to permit more wheel spin before ATC begins to take effect.

MERITOR/WABCO STABILITY ENHANCEMENT SYSTEM

A Meritor / Wabco Roll Stability Control (RSC) System shall be provided on the apparatus chassis. The RSC shall assist in managing road conditions that may result in a vehicle rollover.

The RSC shall intervene to regulate the vehicle's deceleration functions. by automatically reducing engine torque, engage the vehicle retarder and apply pressure to the brakes.

Electronic Stability Control (ESC) shall be included building upon the established RSC system by sensing the tendency of the vehicle to spin around and automatically applying the brakes to reduce that risk.

This system conforms to the requirements of NFPA-1901 4.13.1.2 - If the apparatus is equipped with a stability control system, the system shall have, at a minimum, a steering wheel position sensor, a vehicle yaw sensor, a lateral accelerometer, and individual wheel brake controls.

REAR TIRES

The rear tires shall be 12R22.5-16PR (H) GOODYEAR UNISTEEL G182 RSD traction tread, tubeless radial tires. These tires shall be mounted on 22.5" x 8.25" rims.
Single rear axle GAWR using these tires shall be 27,000 lbs. @ 120 psi.

TIRE SPEED RATING

The maximum tire speed rating is 75 MPH.

ALUMINUM WHEELS

Four (4) polished aluminum wheels shall be supplied and installed on the single rear axle. The 22.5" x 8.25" wheels shall be highly polished on the outboard side.

WHEEL TREATMENT

The aluminum wheels shall be supplied with wheel treatment for a bright finish and wheel protection.

REAR WHEEL TRIM

The rear axle(s) shall be trimmed with mirror finish, 304L grade non-corrosive stainless steel "Lincoln Hat" hub cover and bright finished nut covers.

LASER ALIGNMENT

The chassis shall have a laser alignment performed at the factory before delivery.

Toe in Front Axle - The toe in on a vehicle is set to reduce tire wear and to ensure that the vehicle shall steer in a straight line. Toe in measurements are set to a positive 2.5 millimeters total, giving the vehicle 1.25 millimeters from side to side.

Toe in Rear Axle - The toe in on the rear wheels is set up slightly different in that the axle and wheels are set to ride the "crown" of the road. This is achieved by adjusting the toe to a measurement of no less than 1 millimeter, but no more than 2 millimeters. The ideal measurement is 1.5 millimeters total for both sides.

Cramp Angle - Cramp angle is set to achieve the greatest turning radius possible with the selected components of the vehicle. Each front wheel is set to zero degrees. The wheel is then turned until it reaches the steering stops. This measurement is the cramp angle.

TIRE PRESSURE MONITORING DEVICE

Each tire installed on the apparatus shall be equipped with a tire pressure monitoring device. The device shall consist of a valve stem cap to with an LED tire alert to indicate tire pressure conditions. The LED will flash when the tire drops 8 psi below the factory setting.

DIESEL ENGINE

The chassis shall be powered by a Cummins diesel engine as described below: MODEL: ISL9-450
NUMBER OF CYLINDERS:Six
BORE AND STROKE: 4.49 in (114 mm) x 5.69 in (145 mm)
DISPLACEMENT: 543 cu. in. (8.9L)
RATED BHP: 450 hp (336 kW) @ 2100 RPM
TORQUE: 1250 lb.-ft (1696 N-m) @ 1400 RPM
COMPRESSION RATIO: 16.6:1
GOVERNED RPM: 2200

Standard Equipment on the engine to include the following:
OIL FILTER: A full flow / by-pass combination
LUBE OIL COOLER: High efficiency non-drain back full flow cooling
FUEL FILTERS: Two fuel filters providing 3 / 10-micron absolute filtration STARTER: 12 volts

AIR COMPRESSOR: A Wabco 18.7 cfm compressor shall be provided

ENGINE COOLANT RADIATOR

The engine coolant radiator shall have sufficient capacity to perform under the engine manufacturer installation requirements. The chassis manufacturer shall demonstrate the ability to meet this requirement with the submittal of an approved IQA to the fire department for the apparatus.

This radiator shall have HRPOS top and bottom tanks. These tanks shall have a material thickness of 11 gauge. The top and bottom tanks shall be attached to the header assemblies with a minimum of forty (40) fasteners. These fasteners shall not exceed a center distance of 1.938 inches to reduce the possibility of tank leaks. These fasteners shall be torqued to a value of 29.5 ft-lbs.

The header plates shall be made of 16-gauge brass.

The radiator tubes shall be constructed of .0066-inch-thick brass and have a dimensional size of . 076-inch x .625 inch. These radiator tubes shall have welded tube seams.

The radiator shall contain three (3) rows of tubes arranged in an inline profile across the radiator core. The entire radiator shall a contain (231) tubes. These tubes shall have a smooth bore to allow for radiator cleaning.

In the critically stressed area, where the radiator tubes are attached to the header plates, this joint shall be accomplished with a welding process on the coolant side. In addition to the welded joint a solder fillet joint shall occur on the air side of the core creating a continuous dual bond.

The radiator shall have a louvered serpentine type core that contains fins constructed of .0024-inch-thick copper. These fins shall be spaced to a maximum density of 14 fins per inch of radiator tube. Each fin shall have a louvered surface for high cooling efficiency.

The radiator shall contain an integral coolant de-aeration tank. This tank shall be designed to remove entrapped air or gas from the coolant side of the radiator.

The radiator side rails shall have integrally designed support gussets for the transition to the header attacnt.

The bottom tank of the radiator shall have a drain valve for coolant removal.

The bottom tank of the radiator shall have a transmission cooler with a plate-type design. The plates shall have internal turbulators to break up laminar oil flow across the surface. The cooler shall have 1311 square inches of surface area for water surface contact and heat transfer.

The radiator system shall be pressurized with a cap rated per the cooling system requirements of the specific engine manufacturer.

The high efficiency engine fan shall be encompassed with a radiator shroud to provide the proper air flow from the fan blade to the radiator.

The perimeter of the radiator shall have recirculation baffles to eliminate the possibility of recirculation of "hot" air to the face of the radiator core. The bottom of the radiator shall have a recirculation baffle from the radiator to the frame rails.

COOLANT RECOVERY SYSTEM

A coolant recovery system shall be installed on the chassis. This tank is designed to capture coolant overflow when the engine coolant warms and expands. As the engine cools the overflow is then pulled out of the tank and back into the radiator, thus maintaining proper coolant levels.

CHARGE AIR COOLER RADIATOR

The engine charge-air cooler shall have sufficient capacity to perform under the engine manufacturers installation requirements. The chassis manufacturer shall demonstrate the ability to meet this requirement with the submittal of an approved EPQ to the fire department for the apparatus.

This radiator shall have cast aluminum side tanks. These tanks shall have a material thickness of .200. These tanks shall be attached to the charge-air core with the ALBRAZE construction technique.

The external air fins shall be louvered serpentine and constructed of .006-inch-thick aluminum.

The internal air fins shall be of the lance-and-offset design for greater air turbulence and higher efficiency. The internal fins are to be constructed of .010-inch-thick aluminum.

The charge-air cooler shall be mounted directly in front of the engine coolant radiator. To reduce vibration rubber "iso" mounts shall be used for mounting of the charge-air cooler to the engine radiator.

The charge-air cooler shall contain thermal expansion slots to allow the expansion and contraction of the charge-air core over the wide range of temperatures that are expected in operation.

The charge air piping between the engine and charge-air cooler shall be aluminum tubing with a wall thickness of .065 inch. The system shall utilize four (4) ply silicone rubber woven Nomex

hoses with stainless steel pressure bands. These bands are designed to maintain the hose shape under the pressure of the turbocharger boost air. All clamps used on the charge air piping is to be stainless steel constant torque and shall be installed at each joint.

COOLANT

The coolant system shall contain an ethylene glycol and water mixture to keep the coolant from freezing to a temperature of -34 degrees F.

COOLANT HOSES

The entire chassis cooling system shall have premium rubber hoses. All clamps to be stainless steel worm drive type clamps.

COOLANT SYSTEM CLAMPS

Single wire constant torque clamps shall be used for all cooling system hoses.

HEATER LINE SHUT OFF VALVES

The heater circuit shall have quarter turn shut off valves installed on both the supply and return lines to allow a complete shut off of coolant flow to the cab heaters in hot seasons of the year. These valves shall be installed in addition to the valves in the heater unit(s).

ENGINE AIR INTAKE FILTER

The engine shall be equipped with a K&N heavy duty washable intake air filter. The filter shall utilize a media that does not require oil.

ENGINE OIL

The engine shall have the initial factory fill made with a non-synthetic engine oil meeting the engine manufacturer's recommendations.

ENGINE BRAKE

A "JACOBS" Engine Brake shall be supplied.

The Driver's dash shall include an engine brake control switch.

Activation of the engine brake shall occur at zero throttle position. The transmission ECU shall be programmed to operate in the pre-select downshift mode to maximize the retarding power of the engine brake.

The brake lights shall illuminate when the Jacobs Brake is in operation.

The Jacobs Brake shall be inoperative when the chassis is in pump mode.

The "JACOBS" engine brake shall be covered under the standard five-year Cummins engine warranty.

ENGINE FAST (HIGH) IDLE

The chassis shall be equipped with an Electronic Idle Control (EIC) for the electronic engine. Preset speed is factory adjustable.

The fast-idle provision shall only function when the parking brake is set and the transmission is in neutral. Manual selection of the fast idle shall be controlled by a driver's momentary switch.

Automatic activation of the fast idle shall occur when a low voltage condition exists, the truck is in neutral and the parking brakes are applied.

Cancellation of the fast idle shall be achieved by resetting the manual switch or by depressing the service brake pedal.

CORROSION INHIBITOR

Corrosion inhibitor shall be provided as an additive to the chassis cooling system.

AUXILIARY ENGINE COOLER

The cooling system shall have one (1) SENDURE auxiliary engine cooler mounted in the upper radiator water pipe. The apparatus shall have the fire pump water circulated to the cooler from a valve located on the apparatus pump panel.

SPARK ARRESTOR

A spark arrestor shall be installed in the chassis air intake system. This arrestor shall be mounted behind the intake grille to filter out airborne embers.

FAN DRIVE

A fully variable fan drive system shall be installed on the engine. Variable operation is required to reduce fan noise and improve response time and lower off-speed for maximum efficiency. Control of the fan operation is entirely from the engine and fan ECM with no manual override controls.

EXHAUST SYSTEM

A single exhaust pipe shall be provided for the engine. The exhaust pipe shall be supplied with a heat wrap. The wrap shall extend from the engine turbo charger to just below the frame rail. The exhaust tubing from the turbocharger to the exhaust after treatment device shall be stainless steel.

CUMMINS AFTERTREATMENT SYSTEM

The chassis shall be equipped with a Cummins exhaust after treatment system in compliance with MY 18.

TAILPIPE

The tailpipe shall extend from the exhaust muffler/aftertreatment device to the rear of the vehicle making a 90° bend to exit the vehicle ahead of the rear tires on the curbside of the vehicle. The end of the pipe shall be cut square or perpendicular to the exhaust pipe centerline.

The pipe shall be unpolished stainless steel.

An exhaust gas diffuser shall be furnished on the end of the tailpipe.

DIESEL EXHAUST FLUID SYSTEM

The chassis shall be equipped with a 5-gallon Shaw Development Diesel Exhaust Fluid (DEF) reservoir system. The reservoir shall contain a Multifunctional Head Unit (MFHU) that contains integrated level and temperature sensors. The MFHU also shall contain a coolant powered heater to thaw DEF in conditions below 12°F (-11°C) to meet governmental regulations. The reservoir shall be located on the left frame rail behind the front axle beneath the cab. The mounting system shall use stainless steel mounting brackets to reduce the possibility of corrosion.

TRANSMISSION

The transmission shall be an Allison 3000EVS automatic transmission with electronic controls.

The transmission shall be equipped with a lock-up control circuit that shall automatically shift the transmission into 4th gear lock-up when the pump is shifted into gear.

TRANSMISSION COOLER

An automatic transmission cooler shall be provided as an integral part located in the bottom tank of the radiator. It shall be designed to withstand 165 psi working pressure and an intermittent

pressure of 250 psi. The cooler shall be of sufficient size to maintain the operating temperature within the recommended limits of the transmission manufacturer.

TRANSMISSION FLUID

The transmission shall be provided with heavy-duty transmission fluid meeting Allison specification TES-389.

FIVE SPEED PROGRAMMING

The transmission shall be programmed for five speeds.
The transmission shall be able to shift from first through fifth gear without operator intervention.
The chassis shall be geared for the top speed in 5th gear.

AUTOMATIC NEUTRAL

The transmission shall be provided with circuitry to provide automatic neutral. Setting the parking brake commands, the transmission to neutral when the park brake is applied, regardless of drive range requested on the shift selector. Requires re-selecting drive range to shift out of neutral.

After the transmission has been activated with the automatic neutral feature the shift lever must be returned to neutral and back to drive for midship pump operations.

REMOTE FLUID LEVEL SENSING

The chassis shall be equipped with an electronic low fluid level indicator system for the engine oil, transmission oil, engine coolant and power steering fluid as part of the instrumentation package. This system eliminates the need for daily checking of fluid levels with manual dipsticks.

Coolant over temperature sensors are only capable of sensing excessive coolant temperature caused by clogged radiators, malfunctioning thermostats, failed water pumps or any other "circulation" problem. Upon loss of coolant, however, these temperature sensors must try to respond to hot air which, being a poor thermal conductor, results in signals that arrive only after the engine is severely damaged.

In a like manner, under leaking oil conditions low oil pressure signals are not obtained until the oil pump is starved for oil. Since the oil pump draws liquid from the very bottom of the crankcase pan, these signals arrive only after virtually all oil has been lost. Again, the damage has already occurred.

The liquid level sensor provides an early warning that fluid is being lost and allows corrective action to be taken before damage can occur. By using a sensor to turn on an indicator light, the low fluid level condition is communicated immediately to the operator.

ENGINE COOLANT

The coolant level sensor is located in the upper radiator reservoir. The corresponding LED indicator light is included in the display module.

ENGINE OIL

The engine oil sensor is in the engine oil sump. It monitors the oil level at approximately the 50% level. The corresponding LED indicator light is located to the right of the instrument panel on the doghouse in clear view of the driver.

POWER STEERING FLUID

The power steering fluid sensor is located in the power steering fluid reservoir at the same level as the "Add" indicator on the dip stick. The corresponding LED indicator light is located to the right of the instrument panel on the doghouse in clear view of the driver.

FUNCTION

The LED indicator lights will illuminate when the ignition is placed in the ON position as a test to ensure that the warning circuits are working. They will go out when the starter button is pressed if normal fluid levels are detected. One or more of the lights staying on indicates a low fluid level in the corresponding system(s). Any time the engine is ON and a low fluid level is detected, the appropriate light will illuminate. The sensor output will reset when the ignition is turned off.

TRANSMISSION OIL

The transmission oil sensor is in the transmission oil sump. The fluid level indicator is integrated into the shift selector. Accessing the fluid level status is dependent upon the style of shift selector provided.

The transmission fluid level status is accessed through the "mode" function of the shift selector controls. First, park the vehicle on a level surface, shift to N (Neutral), and apply the parking brake. If equipped with a pushbutton shift selector, simultaneously press the Up and Down arrow buttons. If equipped with a lever shift selector, press the display mode button one time. A code will be displayed on the shift controls indicating that the oil level is HI, LO or OK. If the level is HI or LO, the display will also indicate the number of quarts of oil necessary to be added or removed to bring the oil level into the OK range. It may also display an error code that explains

why fluid level information is not available. The fluid level check may be delayed until the following conditions are met:

The fluid temperature is above 60°C (140°F) and below 104°C (220°F).
The transmission is in N (Neutral).
The engine is at idle
The transmission output shaft is stopped.
The vehicle has been stationary for approximately two minutes to allow the fluid to settle.

See the Care and Maintenance section of the transmission Owner's Manual for a more detailed description of the fluid check procedure along with a complete list of error codes.

DRIVELINES

Universal joints and driveshaft's shall be SPICER 1760 series or equal. The driveshaft tube shall be a minimum of 4.09" diameter with a .180" tube wall thickness. The driveshaft slip joints shall be coated to reduce sliding friction and thrust under high torque loads. Permanent driveline installations shall be balanced to prevent vibration.

FUEL TANK

The fuel tank shall have a capacity of 50 gallons (US) and be D.O.T. certified. It shall be mounted with stainless steel straps bolted to the bottom frame flange to allow for easy removal. The tank construction shall be of 12-gauge steel with single fuel pickup and return tubes. The baffled tank shall be vented to prevent low vacuum and facilitate rapid filling.

The tank shall have a 2" NPT fill to the driver's side of the chassis.

The fuel tank sending unit is to be mounted to the driver's side of the fuel tank for easy replacement without removing body panels.

FUEL LINES

Polyamide fiber, nylon braided, reinforced tubing with push-on reusable fittings shall be provided for the chassis fuel lines.

FUEL/WATER SEPARATOR

The Cummins engine shall be equipped with an integrated fuel / water separator with a self-venting bottom drain valve. This filter shall be able to remove up to 95% of dissolved water and up to 99% of free standing water.

ALTERNATOR

A LEECE-NEVILLE model LN4867J 270 Amp alternator shall be installed on the engine. This alternator is internally rectified and regulated.

FIRETRUCK CAB

The apparatus shall be designed to operate in emergency conditions. These conditions require the apparatus to maneuver into areas at a high rate of speed. To facilitate in these operations a cab-over-engine design is required in order to reduce the overall length of the apparatus thus increasing the maneuverability.

The cab design must be such to provide safe and efficient transport of emergency personnel. The cabin shall be designed with four (4) side doors of the largest size possible and with a grab handle and step arrangement to provide ease of entry and egress.
There shall be up to six (6) positions available for occupant transport with a minimum of four (4) forward facing seating positions in the cab. The number of seats and seating locations are described in detail later in this document.

The apparatus cab shall be of the latest in automotive design, styling and appearance.

CAB MATERIALS AND CONSTRUCTION

The extruded aluminum *xl* cab shall have the following material gauges as a minimum:

Cab floor - 3/16" (.190") aluminum
Front skin - 3/16" (.190") aluminum
Cab side panels - 3/16" (.190") aluminum
Cab rear wall - 3/16" (.190") aluminum
Cab driver's floor - 3/16" (.190") aluminum
Cab officer's floor - 3/16" (.190") aluminum
Cab crew area floor - 3/16" (.190") aluminum
Cab roof - 3/16" (.190") aluminum
Cab doors - 3/16" (.190") aluminum

Roof Rail Section Extending from the front to the rear of the cab above the doors the cab shall have and extruded aluminum section. This section shall be designed to interlock with the roof sheet and incorporate the door drip molding in one single piece.

Upper Transverse Member Amid ship in the cab there shall be a boxed beam header assembly located transverse in the cab from left to right.

Front Door B-Post This vertical box section of the cab located behind each of the front doors provides the slam post for the door latch assembly. This section also is a main member in the cab

skeletal system. The B-Post ties into the Upper Transverse Member to provide torsional stiffness in the open space design of the cab.

Rear Door B-Post The box assembly design of the rear door B-post provides an anchor for the rear door latch assembly. This section is the main vertical support at the cab rear corner providing the anchor point for the rear wall structural lattice network.

Roof Panel Rails - The roof panel sub-assembly shall have extruded hat section supports bonded to the roof skin. These roof hat sections shall be joined to the Cab Roof Rail Section to complete the upper cab skeletal structure. These completed Roof Panel Rails shall provide a grid for maximum roof crush and deflection strength. The roof shall support a minimum weight of 250 lbs. / sq. ft. without permanent roof deformation.

Rear Wall Rails - The rear wall assembly shall have extruded hat section supports bonded to the wall skin. These sections shall be joined to the Roof Panel Rails and to the rear door slam post and floor provide a rear wall grid structure with maximum strength.

Cab Front Wall - The front wall of the cab shall be designed with a double wall construction to reduce the effects of exterior noise in the crew and operator compartment.

CAB DIMENSIONS

The cab shall have the following overall dimensional requirements:

Overall Width - 100 inches
Roof - 12" Raised
Center of front axle to back of cab - 60 inches
Center of front axle to front of cab - 74 inches
Windshield area - 4,200 sq. in. minimum
Front grille opening - 478 sq. in. minimum
Combined side grille opening - 84 sq. in. each minimum
Cab full tilt angle - 45 degrees' minimum
Cab full tilt height - 185 inches' maximum

CAB DOORS

The cab entry and egress shall be designed for a firefighter in full turnout gear. Each door shall open a minimum of ninety degrees to afford the firefighter maximum space.

The doors shall be of a flush design each having exposed, one-piece, polished stainless-steel hinges. The hinge shall be made of 12-gauge material with a minimum hinge pin diameter of 1/4 inch.

The door windows shall have interior and exterior glass weather seals to prevent the influx of exterior air.

The doors shall have exterior and interior paddle type latches for ease of opening with a gloved hand. The paddle latches are to have a rubber gasket, on the outside, separating the handle from the finished painted surface.

FRONT DOORS

The cab front doors shall be of the full-length design enclosing the entire step area of the cab. The door shall be a minimum of 38-1/2 inches wide and 74 inches tall. The front door windows shall have a minimum of 712 square inch area of viewing glass per door. There shall be a fixed piece of forward glass in each of the front doors.

REAR CAB DOORS

The rear cab doors shall be similar to the forward doors and shall be located directly behind the front wheel well area. These doors shall be 86 inches high x 34 inches wide. Each door shall have a roll down rear window with a minimum glass viewing area of 670 square inches.

INTERIOR DOOR LOCKS

All doors shall have door locks with interior controls and exterior keyed door locks. The installation shall be in conformance with FMVSS 206, with specific adherence to 49 CFR 571.206 Section 4.1.3 requiring that "Each door shall be equipped with a locking mechanism with an operating means in the interior of the vehicle". All doors shall be keyed alike. The doors shall be equipped with appropriate safety interlocks to prevent accidental locking of the doors when closed.

DASH TRIM

The drivers cab dash console shall be made of black ABS with an appearance of the latest in automotive design, styling. Accompanying the dash console in the forward section of the cab shall be an officer's side flat dash for the mounting of a mobile data terminal.

CAB GLASS

AS-1 safety laminate glass shall be used in a two piece, wrap around design with a minimum 3760 square inches of windshield area for maximum visibility. The windshield shall have the style of a one-piece assembly with the practical installation of two pieces for lower replacement cost. The windshield shall be readily available from a nationally recognized automotive glass manufacturer that maintains local distribution outlets.

All glass shall be tinted.

All fixed glass shall be installed with a one-piece triple locked rubber lacing material. Due to long term appearance two-piece chrome trim lock lacing is not desired.

SUNVISORS

The driver and officer side of the cab shall be equipped with a sun visor. The vinyl covered visors shall be a minimum of 17-1/2" by 9".

DRIVER SIDE ELECTRICAL CABINET

Beneath the driver's seat there shall be an electrical cabinet designed to house the main battery electrical disconnect and facilitate the installation of an onboard battery charger or battery conditioner. A bolt on limited access; aluminum diamond plate hatch shall be installed on the front side of the seat box. The access hatch shall have a louvered section to provide air circulation to the cabinet. This cabinet shall not be used for casual storage.

WINDSHIELD WIPERS

Two speed electric pantograph wipers shall be installed. These wipers shall have minimum 24" blades and have 28 1/2" wet arm electric pump washers. A 70 oz. Minimum windshield washer reservoir shall be furnished.

FASTENERS

All cab exterior fasteners shall be stainless steel type fastened to the cab with nutserts.

BATTERY ACCESS

The rear cab steps shall have a removable kick panel, providing access to the batteries for routine maintenance and inspection.

CAB CORROSION TREATMENT

The cab shall have a corrosion preventative material conforming to Mil Spec C-16173-C, Grade 1, applied during and after construction. A 10-year warranty against perforation due to rust or corrosion shall be furnished for the cab.

TRANSMISSION RANGE SELECTOR

The transmission shall be controlled by an electro-mechanical lever type shift control. It shall be internally illuminated for night operation and have an internal lock (hold override button) to securely hold the shifter in the position selected.

TRANSMISSION OIL LEVEL SENSOR

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

HEATER / DEFROSTER

A 57,600 BTU heater with a three-speed fan shall be mounted in the front of the cab, centered over the windshield. This heater shall have six (6) adjustable vents to assure windshield defogging.

45,000 BTU AIR CONDITIONING

A climate control system shall be furnished in the cab. The system shall consist of a 45,000 BTU air conditioning evaporator and 33,400 BTU heater centrally located on the forward slope of the raised roof.

The system is to have a 13.1 cu. in. minimum compressor mounted on the engine to provide the compressed refrigerant to the system. The compressor is to be plumbed to a heavy-duty truck, triple fan air conditioning condenser mounted on the cab roof. The condensing unit shall have an aerodynamic shroud that is painted to match the color of the cab roof. There shall be an extended life filter receiver/dryer with a pressure relief valve installed to protect the system from contaminates, moisture, and high pressure. It is to have a sight glass for visual inspection and ease of service.

The evaporator shall have an externally equalized expansion valve and be thermostatically protected to prevent freeze up. Dual high performance 3-speed blowers shall provide a minimum of 650 CFM air flow. Each blower is to be controlled separately. Eight (8) downward facing adjustable diffusers with shutoff capability shall be utilized to direct the air flow through the cab.

The air conditioning controls, on/off switch, thermostat control, and blower switches shall be located on the climate control display module within reach of the driver.

The climate control system shall utilize both automatic and manual control methods.

The climate control display's system standby screen shall maintain all of the climate control functions OFF.

The climate control display's automatic operation screen shall allow the user to select a desired temperature and the climate control system shall automatically choose the temperature mode (cool or heat) and the fan speed (low, medium or high) to maintain the desired temperature.

The climate control display's manual operation screen shall allow the user to set the temperature mode (cool or heat) and the fan speed (low, medium or high) as desired.

CAB INSULATION

Foam rubber type insulation shall be installed in the rear wall and the cab ceiling to provide a better sound and heat barrier. The insulation shall be a minimum of 1" thick. The material shall be compliant with FMVSS-302.

HEATER HOSE INSULATION

The heater hoses from the engine to the heater shall be insulated to reduce heat loss.

EMI/RFI PROTECTION

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

The apparatus proposed shall have the ability to operate in the environment typically found in fire ground operations with no adverse effects from EMI/RFI.

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

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

BATTERY BOX TRAY - STAINLESS STEEL

The battery box trays shall be stainless steel to reduce the corrosive potential of the tray. The battery holds down and brackets and hardware shall also be made of stainless steel.

BATTERY BANK

A single battery system shall be provided, utilizing four (4) high cycle type Group 31 batteries.

This system shall be capable of engine start after sustaining a continuous 150-amp load for 10 minutes with the engine off (NFPA-1901).

A battery disconnect switch (Rated at not less than 450 amps continuous) shall be used to activate the system and provide power to the power panel. A green pilot light shall illuminate to indicate that the1 battery bank is activated.

BATTERY CABLES

All battery wiring shall be "GXL" battery cable capable of handling 125% of the actual load. It shall be run through a heat resistant flexible nylon "HTZL" loom rated at a minimum of 300 degrees Fahrenheit. All cable connections shall be machine crimped and soldered.

STARTING CIRCUIT

One (1) engine start button is to be located on the lower right dash panel. It shall be wired to heavy duty solenoid rated at not less than 1100 amps. The battery indicator light is to be located directly above the start button to indicate that the battery bank is on.

BATTERY POWER BUS BARS

There shall be solid copper buss bars utilized for the direct connections between batteries. These buss bars shall be nickel plated for corrosion resistance and provided with color coded heavy shrink tube between the batteries for short circuit protection.

BATTERY ON INDICATOR LIGHT

A steady burning blue Whelen OS Series LED shall be mounted on the driver's dash facing forward to be seen from outside the front of the cab. The light is to illuminate whenever the battery switch is in the on position and the parking brake is set.

BATTERY CHARGER

A PRO MARINER / ON BOARD SOLUTIONS advanced electronic 4-step battery charger/power supply with a 40-amp output shall be installed, under the driver's seat.

Since shoreline power is not always stable the charger shall be equipped with Auto-Ranging AC Input to automatically accept global voltages of 90 VAC to 270 VAC at 45-440 Hz.

Field Selectable - Use with lead/acid or gel batteries (AGM factory option). Select length of absorption charge cycle based on size of batteries.

In the 4-step charging system the charger will provide the following sequence.

Step 1: Fast Charge - Charger will deliver its maximum amperage rating to the connected batteries for the fastest charge (current regulation mode) until battery voltage is raised to 14.6V (lead acid factory setting). At this time, the ProTech will shift to step 2.
Step 2: Absorption Charge - Maximizes charge and holds voltage (voltage regulation mode) at 14.6V (lead acid factory setting) for 1 to 4 hours (selectable based on battery size), while letting the batteries determine the number of amps they can accept. This mode creates activity in the batteries, reducing sulfate buildup, and conditions the batteries for an extended life. After the programmed 1 to 4 hours have elapsed, the ProTech will shift to step 3.

Step 3: Float Mode - A precision 13.3V (lead acid factory setting) finishing voltage that maintains each battery (step-down voltage regulation mode), which is perfect for short or long storage periods and will never overcharge your batteries. ProTech will deliver its full rated output for house loads including: lighting, electronics and pumps.

Step 4: Recycle - If there are very large loads on the battery while the charger is on, the unit will recycle to the first step, ensuring that batteries stay fully charged.

One-Year Warranty - Includes lifetime repair guarantee. Certified to - UL Marine 1236/SA

REMOTE CHARGE INDICATOR PANEL

A KUSSMAUL 91-94-12 charge indicator shall be supplied.

The remote charge indicator shall be located on the driver's seat box adjacent to the master battery switch.

SHORELINE AUTO-EJECT

A KUSSMAUL Super Auto Eject, model 091-55-20-120, with weatherproof cover shall be provided.

The Super Auto Eject is to be completely sealed to prevent internal contamination of the working components.

The internal switch arrangement of the Super Auto Eject shall be designed to close and open the 120-volt AC circuit after the mating connector is inserted and before the connector is removed. This design shall prevent arcing at the connector contacts to provide long life.

The electrical connection shall be provided as a 120-volt AC - 20-amp type using a NEMA 5-20P connector.

The Auto-Eject cover shall be a Kussmaul 091-55YW, yellow in color.

The Auto Eject assembly shall be mounted on the exterior of the cab behind the driver's door.

BATTERY JUMPER STUDS

Battery jumper studs shall be provided on the chassis. The jumper studs shall be mounted underneath the cab, on the rear of the driver's side battery box. The studs shall be connected to the chassis batteries with 1/0 color coded cables, red for the positive cable and black for the negative cable. The studs shall be protected with color coded plastic covers when not being used.

ENGINE DOGHOUSE

To reduce the noise in the cab the doghouse metal on the inside of the cab shall be completely covered with Acoustiblok sound isolation material. The material shall be sealed at all seams with acoustical sealant.

The engine doghouse inside the cab will be padded with an additional layer of sound and heat absorbing foam and covered with heavy duty vinyl trim upholstery to match or accent the interior of the cab.

The underside of the engine enclosure shall be covered with a sandwiched material for interior cab noise and heat rejection. This sandwiched acoustical material shall have one layer of 1/8" foam, a 3/16" single barrier septum and a 7/8" layer of foam to provide on overall thickness of 1-3/16". The sandwich material shall be chemically bonded to prevent layer separation. A finished surface treatment of metalized film shall be provided on the engine side of the barrier. The acoustical barrier shall be held in place with mechanical fasteners in addition to adhesive. The insulation for protection from heat and sound shall keep the dBa level within the limits stated in the current edition of NFPA 1901.

CAB DOORS - INTERIOR TRIM

To provided durability the interior of the cab doors shall be finished with full length aluminum panel that is finished with Zolatone high abuse paint.

INTERIOR CEILING PADDING AND TRIM

The cab front interior ceiling shall have a one-piece, removable, vinyl headliner to cover all wiring and tubing used for lights and antenna leads.

REAR WALL COVERING

The rear interior wall of the cab shall have a two-piece, removable, wall covering to finish the interior trim and cover all wiring and tubing used for lights and antenna leads.

The rear wall shall be covered in heavy-duty Hushcloth sound barrier material. The Hushcloth is a three-ply material with a 3/16" thick open cell isolation barrier of Polyurethane, a 3/32" thick closed cell Nitrile mid barrier for section reinforcement, and a 1/16" thick embedded pebbled grain wear surface to stand up to the abuse of the fire service in high use departments.

FLOOR COVERING

The front and rear floor areas of the cab shall be covered with "HUSHCLOTH" sound barrier floormats. This floormat shall be a three-ply material with a 3/16" thick open cell isolation barrier of Polyurethane, a 3/32" thick closed cell Nitrile mid barrier for section reinforcement, and a 1/16" thick embedded pebbled grain wear surface.

REAR FACING SEAT BOX COVERING

The rear facing seat box area of the cab shall be covered with "HUSHCLOTH" sound barrier floormat. This floormat shall be a three-ply material with a 3/16" thick open cell isolation barrier of Polyurethane, a 3/32" thick closed cell Nitrile mid barrier for section reinforcement, and a 1/16" thick embedded pebbled grain wear surface. The seat box covering shall blend with the cab interior paint color.

REFLECTIVE MATERIAL - INTERIOR CAB DOOR

The cab and crew compartment doors shall have a minimum of 96 square inches of white reflective material affixed to the inside of each door. There shall be a 2" red chevron stripe applied over the white reflective material on each door.

INTERIOR CAB STEP TRIM

The cab steps shall be completely enclosed behind each door. The top surface of the steps shall be covered with non-skid aluminum treadplate trim.

STEERING WHEEL AND COLUMN

The steering column shall be a DOUGLAS tilt / telescopic type with an integral high beam / turn signal control switch. The column shall have self-canceling design for the turn signal switch. A 4-way warning "Hazard" light switch shall be mounted on the column. For safety, a rubber boot shall be installed to cover the steering shaft from the dash to the floor.

The steering wheel shall be a VIP, 18-inch diameter wood accent-leather wrapped 4-spoke wheel. A lever on the left side of the steering column shall control the telescopic feature.

GRAB HANDLES

One (1) molded grab handle shall be installed on the driver's side on the A Post.

One (1) additional molded grab handle shall be installed inside the cab. The handle shall be located on the officer's side on the A Post.

Two (2) additional molded grab handles shall be installed in the cab. These handles shall be located one each side on the B Posts side of the crew area doors.

RADIO COMPARTMENT

Beneath the officer's seat there shall be a radio compartment with an interior dimension of 19-1/2" wide x 17" long x 7" high.

CAB STEP DIMENSIONS

The front cab steps shall have the following overall dimensional requirements:

Driver's lower step size 10-1/4 inches deep minimum
Driver's lower step size 29-1/2 inches front to back
Officer's lower step size 10-1/4 inches deep minimum
Officer's lower step size 29-1/2 inches front to back

INTERMEDIATE CAB STEP

The cab shall have a full width intermediate "LaserGrip" anti-slip inside step. The intermediate step shall be approximately 9 inches from the top of the lower step to the top of the intermediate step.

INTERIOR CAB STEP TRIM

The cab steps shall be completely enclosed behind each door. No portion of the cab entrance step shall be exposed when the door is in the closed position. The lower step shall be sealed from the underside of the cab to eliminate road splash from entering the step area while the vehicle is driving. The horizontal step surfaces shall be covered with bright aluminum tread plate meeting the requirements of NFPA-1901.

The vertical toe kick surface area of the cab step wells shall be covered with aluminum tread plate.

REAR SEAT FOOT REST

A "LaserGrip" foot rest shall be provided in the crew area for the outboard rear facing seats. The foot rest shall provide an additional flat surface in the wheel well area.

COMPARTMENT OPEN LIGHT

A Red Open Compartment Flashing Light, Whelen OS Series LED shall be mounted on the driver's side face of the overhead panel. A chrome flange is to be supplied with the light.

This light is wired with a flasher to the power panel for completion to circuit on the body.

The light circuit shall be wired so that the light circuit is deactivated when the parking brakes of the apparatus are applied. A label shall be applied adjacent to the light '**DOOR OPEN**'.

TELE-LIGHTS RAISED LIGHT

A Blue Flashing Light, Whelen OS Series LED shall be mounted on the driver's side face of the overhead panel. A chrome flange is to be supplied with the light.

This light is wired with a flasher to the power panel for completion to circuit on the body.

The light circuit shall be wired so that the light circuit is deactivated when the parking brakes of the apparatus are applied.

A label shall be applied adjacent to the light '**TELE-LIGHTS RAISED**'.

Interior Lighting Group - 1871W - 1871SFO

LED Strip Light Interior Light Packages

CAB FLOOR LED STEP LIGHTING

The floor of the cab shall be trimmed with a ribbed aluminum extrusion. The extrusion shall protrude as an approximately 3/4" over the floor area to provide a mounting channel and guard for an LED integrated light. The LED lighting shall illuminate the step area of the cab and all step lights shall be illuminated when any door is opened and the battery selector switch is in the on position. The lighting shall be operable in either white or red depending upon control circuitry.

DRIVER & OFFICER AREA LED CAB LIGHTING

There shall be a white LED strip lighting mounted above the full length of each front door in the cab. The strip light shall be mounted in an aluminum extrusion and shall face the center of the cab. The lighting shall be operable in either white or red depending upon control circuitry.

The lighting shall be operated opening a cab door.

The red LED lighting for the officer door and rear crew area doors shall be operated by a switch in the driver's area.

The white LED lighting for the officer door and rear crew area doors shall be operated by a switch in the driver's area.

CREW AREA WHITE LED CAB LIGHTING

There shall be a white LED strip light mounted in the cab. The LED strip light shall be mounted at the ceiling on the rear wall and shall run the full width of the cab. The strip light shall be mounted in an aluminum extrusion and shall face the rear of the cab. The lighting shall be operable in either white or red depending upon control circuitry.

The lighting shall be operated opening a cab door.

CREW AREA WHITE LED CAB LIGHTING

There shall be a white LED strip lighting mounted above the full length of each cab crew door in the cab. The strip light shall be mounted in an aluminum extrusion and shall face the center of the cab. The lighting shall be operable in either white or red depending upon control circuitry.

The lighting shall be operated opening a cab door.

The red LED lighting over the crew area doors shall be operated by a toggle switch mounted on the forward post of the crew area door on each side of the cab.

All interior cab lighting controlled by the door opening switch circuit shall be color selected by a switch in the driver's area. The selected color shall stay 'in-state' until the selector switch is changed by the driver. Resetting the battery selector switch shall not change the state of color selected.

OFFICER MAPLIGHT

A Federal Signal LF12TS-LED maplight shall be mounted on the A pillar on the Officer's side of the cab.

DRIVER INSTRUMENTATION AND CONTROLS

The gauges shall have red LED back lighting for enhanced visibility. Upon on initial ignition sequence a lamp check function shall illuminate the warning light telltales, the self-diagnostic message center shall sequence the warning light telltales if data link communications are lost. The instrument panel shall include the following gauges and indicators.

Electronic speedometer with LCD odometer Tri cluster gauge that includes:
Electronic tachometer
Engine coolant temperature gauge, with warning light and buzzer Engine oil pressure gauge, with warning light and buzzer
Transmission fluid temperature gauge, with warning light and buzzer Two air pressure gauges, with warning light and buzzer
Voltmeter, with low voltage warning light and buzzer Fuel level gauge
High beam indicator light Parking brake set light Turn signal indicator lights

The lighting control panel is to be located to the left side of the instrument panel. The lighting control panel shall include the following:

Headlight control switch
Dash rheostat for instrumentation lighting control Wiper and washer control switches

The engine control panel is to be located beneath the instrument panel on the driver's right-hand side. The engine control panel shall include the following:

Keyless ignition switch with a green pilot light

The apparatus control panel is located beneath the instrument panel on the driver's left-hand side. The apparatus control panel is designed for the location of pump shift controls.

AUDIBLE TURN SIGNAL REMINDER

There shall be an audible alarm that shall sound when the turn signal remains flashing for a distance greater than one mile. The reminder shall not sound when the hazard lights are operating.

AUDIBLE LIGHTS ON REMINDER

There shall be an audible alarm that shall sound when the headlight switch is left in the on position and the ignition is off. The alarm shall self-cancel after 2 minutes of operation.

AUDIBLE PARKING BRAKE REMINDER

There shall be an audible alarm that shall sound when the parking brakes are NOT set and the ignition is turned off. This alarm shall self-cancel after 2 minutes.
The Parking Brake reminder shall sound an audible alarm when the parking brakes are set and an indicated speed of over two miles per hour occurs.

DUAL TRIP ODMETERS

There shall be two (2) trip odometers in the driver's information center. Each shall be capable of independent operation and reset. They shall be labeled Trip1 and Trip2 when the trip mileage is shown in the LCD panel.

SPEEDOMETER ACTIVATED IN PUMP MODE

The speedometer and odometer shall be activated while in pumping mode.

LOW FUEL LIGHT

A "Low Fuel" warning light and alarm shall be installed in the dash message center. This light shall illuminate when the apparatus fuel level reaches 25% of the fuel remaining.

TRANSMISSION OVERHEAT WARNING LIGHT

A transmission oil temperature light with alarm shall be provided on the dash message center.

LOW VOLTAGE WARNING

A low voltage indicator light shall be installed on the dash message center. An alarm and the dash indicator light shall activate when the system voltage drops below 11.8 volts.

AIR CLEANER RESTRICTION INDICATOR

An air cleaner restriction indicator shall be installed in the driver's message center. The indicator shall provide visual
warning when a high air restriction condition exists for a minimum of 4 seconds.

LOW COOLANT WARNING

Low coolant warning shall be accomplished through the engine electronics to provide driver warning via the engine stop warning light.

INTERMITTENT WIPER CONTROL

A rotary combination intermittent electric wiper / washer switch shall be provided on the left-hand side of the driver's dash.

ONBOARD ELECTRONIC OPERATION AND MAINTENANCE MANUAL

There shall be a USB port in the vehicle cab to provide in cab access to electronic copies of the Vehicle Operation and Maintenance Manuals. The following information shall be accessible through the in cab electronic Vehicle Operations Manual (eVom^{TM}).

Operator's Manual
Construction Bill of Material Parts List Water Tank Certification
Pump Certification Pump Test Certification

Electrical System:
Complete wiring schematics for the vehicle.
Diagrams of the vehicle showing the wiring harness routing within the vehicle. Each of these diagrams shall include the connectors between the harnesses that provide a hyperlink to a drawing of the actual connector where pin functions can be examined.
Schematics for each system of the vehicle shall be provided with hyperlinks to the connectors for pin designations
and to the vehicle drawings for harness location within the vehicle.
As built wiring information

Air System:
Complete air system schematics for the vehicle.
Diagrams of the vehicle showing the air tubing routing within the vehicle.
Schematics for each system of the vehicle shall be provided with hyperlinks to the tanks and valves and to the vehicle drawings for exact location within the vehicle.

CONTROL CENTER

Mounted on the doghouse there shall be a black ABS driver / officer control center. This area shall include various controls and functions that must be available to the driver and officer. On the top of the control center there shall be an access panel for maintenance and troubleshooting of devices mounted on the control center.

The switch panel shall be a Class 1 Smart Programmable Switch (SPS) panel installed as a multiplexed node to provide input and output information to the apparatus electrical system. The panel shall have ergonomic rubber molded rocker type switches with backlighting.

The panel shall include one (1) function as a master control switch to allow for preselection of response mode functions. The remaining switches shall be programmed and labeled with the manufacturer standards as to the custom options selected for the vehicle.

PARKING BRAKE CONTROL VALVE

The parking brake control valve shall be located in the driver's dash engine control panel.

TEMPERATURE MONITOR

A Kussmaul Temperature Module shall be installed in the driver's area of the cab. The module shall have a built-in LED indicator to show the outside temperature in either °F. The monitor display will blink at 32°F to indicate the roads may be icy.

CUP HOLDERS

There shall be two (2) recess mounted cup holders mounted on top of the doghouse console.

MULTIPLEXED ELECTRICAL SYSTEM

The apparatus shall be equipped with a Class 1 ES-Key Management System for complete control of the electrical system devices. This management system shall be capable of performing load management functions, system monitoring and reporting, and be fully programmable for control of the electrical system.

The ES-Key system shall utilize a Controller Area Network (CAN) to provide multiplexed control signals for "real time" operation. The system shall consist of the following components:
Universal System Manager (USM) - The USM device shall be the CAN network controller and provide various functions to the apparatus such as load management. The USM shall be programmed from a network interface to a PC computer.
Power Distribution Module(s) (PDM) - The PDM shall be a control device on the network with a primary
function as power distribution. Receiving control signals from the USM the PDM turns on and off relays providing power to its connected loads. The PDM also shall contain digital switch inputs allowing for input clustering throughout the apparatus.
Information Display Module - For displaying text, warnings and diagnostics. The information Display
Module shall allow the fire department to access and change load management shedding priority and maintenance text listing the routine maintenance items and lubrication capacities on the apparatus.
Input / Output Module - The module shall have 16 inputs to communicate with the USM and 3 outputs for
various chassis functions.

The ES-Key system shall provide diagnostic capabilities for troubleshooting the electrical system of the apparatus.

CHASSIS COLOR CODED WIRING

All chassis wiring shall be type "GXL" in accordance with S.A.E. J1128 and NFPA-1901. ALL wiring shall be **COLOR CODED** and continuously marked with the circuit number and function.

All wiring to be covered in nylon heat resistant "HTZL" loom rated at a minimum of 300 degrees F exceeding the heat requirements of NFPA-1901.

A battery "loop back" ground circuit shall be supplied for the EDS system to reduce the possible effects of Electromagnetic and Radio Frequency Interference.

The chassis cab, engine and transmission shall be electrically bonded to the chassis frame rails with braided ground straps.

ELECTRICAL SYSTEM CONNECTORS

All multiple conductor electrical connections shall be made with Packard electrical connectors. The Packard connectors shall become mechanically locked when mated.

All single wire terminations requiring special connectors with a ring or spade terminal shall be crimped, and wrapped with heat shrink tubing.

INFORMATION DISPLAY MODULE

The Information Display Module for displaying text, warnings and diagnostics. The information Display Module shall allow the fire department to access and change load management shedding priority and maintenance text listing the routine maintenance items and lubrication capacities on the apparatus. For displaying text, warnings and diagnostics. The information Display Module shall allow the fire department to access and change load management shedding priority and maintenance text listing the routine maintenance items and lubrication capacities on the apparatus.

DUAL PORT USB CHARGING PORT

A Kussmaul 3-amp Dual USB charging port shall be installed in the driver's area of the cab. A second USB charging port shall be installed in the officer's area of the cab. The charging port shall have a built-in LED indicator to show that the device is powered.

The USB charging port shall be powered with the battery power switch in the cab.

CUP HOLDER

There shall be a cup holder mounted on top of the doghouse console. The black powder coated console shall include two
large cup holders and a Kussmaul 091-219 dual port USB charger.

No Rear Seat Base Mounted Cupholder

BACK-UP CAMERA / GPS

There shall be supplied a Garmin NUVI 2798LMT combination back up camera and GPS. The seven (7) inch monitor screen shall be mounted in the cab console utilizing a RAM mounting system with the ability to have 360° adjustment
without the use of tools. The GPS functionality of the unit shall be provided with lifetime Map updates. The camera shall be mounted recessed in the rear bumper.

The monitor for the back-up camera shall be mounted on top of the engine doghouse within view of the driver to aide in backing up the apparatus.

The backup camera system shall be powered with the ignition power in the cab. Operation of the camera will be by the driver with the monitor controls.

PUBLIC BROADCAST RADIO

The cab shall be equipped with an AM/FM Stereo Radio with CD Player and four ceiling mount recessed speakers. The radio a JVC KD-R975BTS shall be equipped with an aux input on the front panel, USB input on the front and rear with built in Bluetooth technology.

ROAD SAFETY KIT

One (1) 2-1/2# ABC DOT Approved fire extinguisher shall be provided. The fire extinguisher shall be shipped loose with the chassis.

One (1) set of DOT approved hazard triangles shall be supplied with the chassis. They shall be stored in a plastic case and shipped loose with the chassis.

CAB CRASHWORTHINESS TEST

Dynamic tests shall be performed to evaluate the crashworthiness of the proposed vehicle cab configuration to the requirements of NFPA 1901-09 section 14.3.2.

Cab roof strength shall be tested utilizing the dynamic preload criteria from SAE J24221 paragraph 5 specifications and procedures.

Front impact strength integrity shall be tested utilizing SAE J24202 with ECE R293 Annex 3 paragraph 4 equivalent energy.

Quasi-static roof strength shall be based on SAE J2422 paragraph 6 and ECE R293, paragraph 5 specifications and procedures.

A letter of certification shall be provided upon request by the department.

EXTERIOR GRAB HANDLES

The cab shall have a bright anodized extruded aluminum 24" grab handles at each door position. The aluminum shall be bright anodized for long service. Molded rubber gaskets shall be installed under the grab handles to protect the painted surface of the cab.

RED WARNING LIGHT, CAB HANDRAILS

The rear door cab handrails shall contain red integrated LED lighting. The lighting shall be integrated into the grab bar, directed toward the rear of the apparatus. The LED lights shall flash with the emergency warning lights.

AMBER SIDE TURN SIGNAL, CAB HANDRAILS

The front door cab handrails shall contain amber integrated LED lighting. The lighting shall be integrated into the grab bar, directed toward the rear of the apparatus. The LED lights shall flash with the directional signals.

"1871 SERIES STYLE" FRONT GRILLE

A stainless-steel square, three-dimensional bright polished stainless-steel front grille shall be installed on the front cab face. The front grille shall have a radiator rock guard to assist in preventing damage to the radiator core.

The cab shall have one (1) engine "hot" air exhaust and one (1) engine air cleaner intake, on each side of the cab. These openings shall be covered with a honey comb wire screen and shall have a bright polished stainless-steel outer grille.

CAB MUDFLAPS

Mud flaps shall be installed behind the front tires. These mud flaps shall be a minimum of 22" wide to protect the underneath of the cab and body.

CAB GROUND LIGHTING - LED

There shall be one (1) white LED strip light in an armored extrusion shall be mounted beneath each cab door. These lights shall be designed to provide illumination on areas under the driver and crew riding area exits. All cab ground lights shall automatically activate when any cab door is opened.

MIRRORS, HEATED REMOTE

The cab mirrors shall be Mekra Lang 400 Series Aero mirrors with a break-away bracket. The flat glass head shall be heated and remote control. Below the flat mirror there shall be a convex head. The mirror heads shall have a smooth chrome plated high impact non-metallic housing.

No Mirror Options

CAB SIDE WINDOWS

Two AS-2 tempered glass, fixed side windows, 26-1/2" high x 16" wide shall be furnished, one on each side behind the forward doors. All glass shall be tinted. These windows shall be installed with a one-piece triple locked rubber lacing material.

ELECTRIC WINDOWS

The front (2) roll down door windows shall be equipped with electrically operated mechanisms to control the opening and closing of the windows. Control shall be with a momentary switch near the door.

One (1) additional switch shall be supplied in the driver's door to control both of the power windows from the driver's position.

WINDOW TINTING

The cab side, crew door and, (cab rear if equipped) windows shall have GRAYLITE II tint (9% visible) to provide privacy and to assist in reducing the amount of heating inside the cab due to direct sunlight and unwanted glare.

UNDER CAB ENGINE MAINTENANCE LIGHTS

Two (2) LED engine maintenance lights shall be supplied beneath the cab. These lights shall illuminate automatically when the cab is tilted to the full tilt position.

STAINLESS CAB FENDERETTES

To reduce road splash on the cab sides, polished stainless steel fenderettes shall be installed around each the wheel opening.

EXTERIOR REAR WALL DIAMOND PLATE OVERLAY

The cab exterior rear wall shall be covered with a single sheet of bright aluminum tread plate to protect the back of the cab from scratches.

CAB TILT SYSTEM

The cab shall tilt a minimum of 45 degrees for ease of serving. Tilting shall be accomplished by means of a tilt pump connected to two (2) heavy duty lift cylinders. It shall be equipped with a positive locking mechanism (service lock) to hold the cab in the full tilt position. Release of the service lock shall be by means of a pull type cable assembly. The cylinders shall have a velocity fuse at the base to prevent the cab from falling in the event of a hydraulic hose failure. The cab shall be capable of tilting 90 degrees for major engine service, if necessary. The 90-degree cab tilt shall be accomplished by
removing the cab cylinder pins, removing one bolt in the steering shaft, and removing the front bumper and treadplate.

The cab shall have a three (3) point cab locking system. To prevent undue stresses in the cab, the cab mounting shall incorporate a five (5) point load mounting system.

The front cab pivot/lock assemblies shall utilize four (4) radially loaded, bonded rubber, axial mounts. These mounts shall have a maximum radial load rating of 925 pounds each and a torsional rating of 25 lbs.-in/deg. Two one (1) inch diameter cab pivot pins shall be installed at the front of the cab.

The rear cab lock shall be center point mounted to prevent normal twist of the chassis from affecting the cab mounting, cab structure and windshield areas of the cab. This rear cab lock shall be mounted on a chassis crossmember to provide a stable platform for the locking system. The cab lock shall be mounted to a baseplate that is fastened to rubber isolators to reduce road noise and provide additional movement of the cab lock. This locking system shall automatically open prior
to the cab tilting and automatically relatch when the cab is lowered completely into the travel position.

Two (2) outboard frame mounted urethane "V" blocks shall be provided at the rear of the cab. These dual purpose mounts
shall align the cab upon lowering as well as provide non-latching support for the cab in the down position. With this system, extreme chassis twist shall allow the cab to move independently of the rear cab supports, reducing the structural stress damage often caused by outboard dual cab locking systems.

An electric-over-hydraulic cab tilt pump shall be supplied. This pump shall have a remote control for cab tilting operation. The control shall be "safety-yellow" in color.

CAB TILT INTERLOCK

The cab lift system shall have a cab tilt interlock. The cab tilt shall not be able to be activated unless the master battery switch is in the on position with the parking brake set.

INTERIOR FINISH

The entire interior of the cab shall be painted with spatter paint, black in color. Black spatter paint is selected for ease of repairs when the interior is scratched.

The cab metal finish shall be covered with one coat of base self-etching primer to fill the small surface imperfections. Then the interior of the cab is to be blocked and a coat of sealer-primer is to be sprayed to the interior finish.
Next a sealer primer is applied and shall be sanded to a smooth finish ready for final color coat application. Two (2) coats of finished paint are to be applied to a final thickness of 4 mills.
The following interior components shall be finished in black:

Overhead console
Sun visors

The interior headliner of the cab shall be black in color.
The interior rear wall covering of the cab shall be black in color. The interior flooring material of the cab shall be black in color. The interior door panel material of the cab shall be black in color.
The doghouse covering material in the cab shall be black in color.
The dash housing, doghouse console; when so equipped; and the officer's glove box or console shall be black in color.

CAB EXTERIOR FINISH

The exterior doors and all fixed cab glass are to be removed from the cab prior to the paint and body process beginning.

The final finish of the cab shall be to fire apparatus standards; exhibiting excellent gloss durability and color retention properties.

PREPARATION

The removal of all contaminates and oxidation is essential to the final effect of a finish system, the cab shall be precleaned with a Wax and Grease Remover and prior to evaporation, towel dried.

To remove all oxidation and foreign materials, the cab shall be sanded with a 180-grit abrasive using an orbital type disc sander.

All weld marks and other major surface imperfections shall be filled with a polyester type body filler, prior to body filler application special attention shall be given to the areas requiring filler again sanding and cleaning.

The body fillers shall be thoroughly mixed in accordance with the manufacturer's directions.

After the final coat of filler is sanded, spray polyester shall be applied in sufficient amounts as to provide a final base and sanded with abrasive paper.

PRECLEAN

Within 45 minutes of pretreat the cab must be again washed with a Wax and Grease Remover using a "Scotch brite pad". Towel dry prior to evaporation.

Special precaution shall be taken NOT to saturate any polyester body fillers with the cleaning solvents.

PRETREAT AND PRIMERS

The pretreat and primer applications shall be made in two independent steps. A combined pre-treat/primer one product application shall not be allowed as a substitute.

The prepared substrate shall be pretreated with an acid curing 2-component Transparent Primer. This pretreat shall be designed to provide corrosion protection and to create an adhesive bond between the substrate and the surface applications.

It is critical that the body fillers not receive a saturation of solvents associated with the pretreat application. Only the pretreat over spray resulting from product application to the adjacent metal areas should be allowed to come in contact with the body fillers.

All polyester body fillers are porous, and shall absorb liquids. Solvents when absorbed not only soften but shall create swelling of the polyester filler. After sanding and later shrink the fillers shall create blemishes in the painted surfaces.

Prior to complete primer application, each area with applied body fillers be precoated with 2-dry applications of primer (sander surfacer) of which shall be allowed to "Touch Dry" between coats. This procedure shall isolate the filled areas and protect them from subsequent product applications.

The primer (sander surfacer) shall be a poly-acrylic resin, zinc and chromate free surfacer that is designed to create a superb surface smoothness, increase the depth of color, and insure top coat gloss.

The cab after pretreat and pre-coat shall be primed with a 3 to 4 medium applications of a Hi-Build Tintable Surfacer.

To create a finish base that meets the rigid requirements of the fire and emergency service; the primed surface shall be dry sanded smooth thus removing all texture and surface imperfections with a 320 grit (minimum) sanding abrasive.

FINISH AND COLOR COATS

The color coat application shall consist of two to three applications of acrylic urethane color coat. After the color coat has been applied, the cabs shall be sprayed with 1.5 to 2.0 mills of clear coat finish. The clear coat finish is then sanded and buffed to remove any imperfections that can occur during the application of the color coat.

The final finish shall be free of dirt and sags and shall meet a minimum grade of 7 when compared to the "ACT" general orange peel standards by "ACT" Laboratories, Inc. Of Hillsdale, MI.

The final sanding and buffing of the clear coat shall result in a flat / glass like finish. The clear coat shall also provide a UV barrier to prevent fading and chalking.

PPG brand urethane materials will be used for the cab exterior paint.

DRIVER'S SEATING POSITION

The seat shall be H.O. Bostrom, Sierra 500, ABTS, with air ride suspension, high back seat with 5" of fore and aft slide adjustment. The seat shall have adjustments for height and ride with up to 3" of vertical travel. The seat shall contain a seat mounted 3-point seat belt with a shoulder belt adjustment of 4.7 inches.

OFFICER'S SEATING POSITION

The seat shall be H.O. Bostrom, Tanker 500 Series Self-Contained Breathing Apparatus (SCBA) type seat with a fixed bottom cushion and a pivoting head rest. The seat shall contain a seat mounted 3-point seat belt with a shoulder belt adjustment of 4.7 inches.

SCBA FILLER PADS

The SCBA seat is to have a filler pad installed to provide a smooth back for the firefighter when the air breathing apparatus is not in use.

SCBA SEAT BRACKET

There shall be a H.O. Bostrom SecureAll™ self-contained breathing apparatus bracket mounted into the seat cavity.

CREW AREA - REAR FACING LEFT OUTBOARD SEAT POSITION

The seat shall be H.O. Bostrom, Tanker 500 Series Self-Contained Breathing Apparatus (SCBA) type seat with a fixed bottom cushion and a pivoting head rest. The seat shall contain a seat mounted 3-point seat belt with a shoulder belt adjustment of 4.7 inches.

SCBA SEAT BRACKET

There shall be a H.O. Bostrom SecureAll™ self-contained breathing apparatus bracket mounted into the seat cavity.

CREW AREA - REAR FACING RIGHT OUTBOARD SEAT POSITION

The seat shall be H.O. Bostrom, Tanker 500 Series Self-Contained Breathing Apparatus (SCBA) type seat with a fixed bottom cushion and a pivoting head rest. The seat shall contain a seat mounted 3-point seat belt with a shoulder belt adjustment of 4.7 inches.

SCBA SEAT BRACKET

There shall be a H.O. Bostrom SecureAll™ self-contained breathing apparatus bracket mounted into the seat cavity.

CREW AREA - FORWARD FACING LEFT INBOARD SEAT POSITION

The seat shall be H.O. Bostrom, Tanker 500 Series Self-Contained Breathing Apparatus (SCBA) type seat with a fixed bottom cushion and a pivoting head rest. The seat shall contain a seat mounted 3-point seat belt with a shoulder belt adjustment of 4.7 inches.

SCBA SEAT BRACKET

There shall be a H.O. Bostrom SecureAll™ self-contained breathing apparatus bracket mounted into the seat cavity.

CREW AREA - FORWARD FACING RIGHT INBOARD SEAT POSITION

The seat shall be H.O. Bostrom, Tanker 500 Series Self-Contained Breathing Apparatus (SCBA) type seat with a fixed bottom cushion and a pivoting head rest. The seat shall contain a seat mounted 3-point seat belt with a shoulder belt adjustment of 4.7 inches.

SCBA SEAT BRACKET

There shall be a H.O. Bostrom SecureAll^{TM} self-contained breathing apparatus bracket mounted into the seat cavity.

FORWARD FACING SEAT RISER

The center forward facing seat(s) shall be installed on a powder coated aluminum riser. The front of the seat riser will be open without a restraint system to provide a location for storage of small lightweight gear.

SEAT COVERING MATERIAL

The seats shall be covered in grey black Durawear™, a high strength-wear resistant, waterproof fabric. No Heated Seat Cushions

SEAT BELT WARNING LABELS

The cab shall be equipped with two (2) seat belt warning labels. These labels are to be in full view of the occupants in the seated position.

VEHICLE DATA RECORDER

Apparatus shall be equipped with a Class1 “Vehicle Data Recorder and Seat Belt Warning System” (VDR/SBW) that is connected to the power train CAN (Controller Area Network) bus consisting of transmission (TCM), engine control (ECM) and antilock brake (ABS) modules mounted on the apparatus. The VDR/SBW will function per NFPA 1901-2009 sections 4.11 (Vehicle Data Recorder) utilizing the power train’s J1939 data and 14.1.3.10 (Seat Belt Warning) using the Class1 “Seat Belt Input Module” for seat occupied and belt status information.

The VDR data shall be downloadable by USB cable to a computer using either Microsoft™ or Apple™ Operating Systems using Class 1/ O.E.M. supplied reporting software.

SEAT BELT WARNING SYSTEM

There shall be a seat belt indicator system supplied in the cab. The indicator system shall indicate seat belt use for each individual seating position when the seat is occupied, the seat belt remains unfastened and the parking brake is released.
A display panel shall be supplied in the dash area. The panel shall have an audible indicator and a red light display to indicate that a seat belt has not been fastened.

SEAT BELT WARNING SYSTEM - MONITOR

Mounted in the overhead console in the driver's area the indicator system shall indicate seat belt use for each individual seating position when the seat is occupied, the seat belt remains unfastened and the parking brake is released.

FRONT BUMPER

A 12" high heavy-duty 10-gauge, polished stainless steel, wraparound, 2-rib front bumper shall be provided the full width of the cab.

BUMPER EXTENSION

The front frame extension shall be bolted directly to the main rail. The extension and main rail joint shall have a 3/8" thick side plate for reinforcement. The completed apparatus must be able to be lifted at the front bumper without structural damage to the front extension for towing of a disabled vehicle.

The front bumper face shall extend 21 inches ahead of the front face of the cab skin.

FRONT SUCTION PIPING FOR SWIVEL

A 5" front suction pipe shall be provided with a Victaulic groove on the rear end and a copper vent line from the high to the low point shall be installed for purging air during suction operation. The front suction pipe is to begin 42.81 inches behind the centerline of the front axle, going forward and over the front axle using long sweep 90-degree elbows and 45-degree bends. The suction is to run out to the front bumper and turn up 90 degrees for installation of a front suction swivel. The pipe shall terminate with a 5" Male National Pipe Thread.

FRONT SUCTION PIPING SWIVEL

An Elkhart model 348, 6" NHT male brass outlet suction elbow with a removable screen shall be provided for the front suction piping.

The suction swivel shall be painted job color.

STYLE 7 ¾" DRAIN VALVE

An Akron Brass Style 7, 3/4" Drain Valve item 00070001with brass handle shaft and body shall be installed in the front suction intake pipe. The small and compact drain valve shall be made of brass and have 3/4" NPT female inlet and outlet thread. There shall be a tag on the front bumper labeled 'DRAIN' adjacent to the location of the front suction drain.

TOW HOOKS

Two (2) chromed tow hooks shall be provided and shall be attached directly to the front frame extension under the bumper. These tow hooks shall be attached with two Grade 8 bolts with hardened washers and Grade "C" distorted thread locknuts.

GRAVELSHIELD

A gravelshield shall be installed filling the area above the extension rails. This gravelshield shall be constructed of .125" thick NFPA non-skid, bright, non-skid, aluminum treadplate. The gravelshield shall be supported at the front by the top flange of the stainless-steel bumper. At the rear, the gravelshield shall be supported by a steel substructure.

CENTER HOSEWELL

A hosewell shall be installed in the center of the gravelshield. The hosewell shall be constructed of .125" aluminum. The upper edges of the hose well shall be tapered to allow for smooth, snag free removal of the hose. The hosewell shall be 26-1/2" wide x bumper depth deep x (extension - 6") front to back. The hosewell shall be mounted between the bumper extension rails.

HOSEWELL COVER

The hosewell shall include a diamond plate hinged cover. The cover shall be manufactured with bevel style ends. A "D-Ring" handle shall be used to open the lid with a gas shock to hold the lid in the open position.

OPEN GRATE MAT - HOSEWELL

The floor of the hosewell shall be covered with black colored, open grate mat for improved ventilation.

AIR HORNS

Dual stutter tone air horns shall be recessed into the front bumper, one each side.

AIR HORN IGNITION CONTROL

To eliminate inadvertent operation the chassis air horns shall be operable only when the battery selector and ignition switch are in the "ON" position.

AIR HORN CONTROL SWITCH

The chassis air horns shall be controlled by a lanyard with a 'Y-chain'. The lanyard chain shall be mounted to the center of the overhead console within reach of both the driver and officer and shall terminate at the cab center.

AIR HORN OPERATION

The air horn and the electric horn shall be sounded simultaneously by depressing the horn button in the steering wheel.

ELECTRONIC SIREN

A Whelen electronic siren control, model 295SLSA1 full feature with 17 Scan-Lock siren tones including Radio Rebroadcast, Public Address, Manual, Wail, Yelp, Air Horn, Electronic Mechanical Siren tones and Piercer tones and hard-wired microphone, shall be provided.

The siren control shall be mounted on top of the engine doghouse within reach of the driver and officer.

SIREN SPEAKERS

There shall be two (2) Cast Products polished aluminum 100-watt speakers provided. The speakers shall be recessed into the front bumper, one each side, immediately outboard of the chassis frame rails.

ELECTRONIC CHASSIS OPERATOR'S MANUAL

An electronic Operator's Manual w/Parts List - One Set shall be provided with the chassis.

Operator's Manual
Construction Bill of Material Parts List Water Tank Certification
Pump Certification Pump Test Certification

Electrical System:
Complete wiring schematics for the vehicle.
Diagrams of the vehicle showing the wiring harness routing within the vehicle. Each of these diagrams shall include the connectors between the harnesses that provide a hyperlink to a drawing of the actual connector where pin functions can be examined.

Schematics for each system of the vehicle shall be provided with hyperlinks to the connectors for pin designations
and to the vehicle drawings for harness location within the vehicle.
As built wiring information

Air System:
Complete air system schematics for the vehicle.
Diagrams of the vehicle showing the air tubing routing within the vehicle.
Schematics for each system of the vehicle shall be provided with hyperlinks to the tanks and valves and to the vehicle drawings for exact location within the vehicle.

FIRE APPARATUS SAFETY GUIDE

Pursuant to NFPA 1901, 2016 edition, 40.20.2.3 (20) one (1)(1) copy of the latest edition of FAMA's Fire Apparatus Safety Guide shall be supplied with the apparatus.

== Pump Module, 47" Side Mnt, Gen IIIi - 4.001 ==

HYDRA TECHNOLOGY

The pump module must employ Hydra Technology. Due to the design a pump module manufactured with Hydra Technology is compact in size; massive in performance.

Each component in the module must undergo a selection and placement analysis staff engineers. Utilizing advanced 3D software, the engineer's goals must provide component placements for ergonomics with a completed module that produces maximum water flow with optimum versatility. Only after the complete analysis and build of the module in the computer can the build of the hardware in the shop begin.

Pump module design beginning with a foundation; cage framework assemblies that are precision manufactured from strong corrosion free heavy wall stainless steel tubing. This framework mounts to the truck frame through a mounting design complimented with iso-mount elastomer cushions. The result shall be a mounting system that allows for the
twisting movement of the truck frame without undue stress loading of the pump module.

Next assembled shall be the stainless side panels. Brushed, mirror polished or power coated the stainless-steel side panels provide strength and durability. Precise engineering allows each panel to be laser machined before assembly; instead of drilling holes technicians shall spend their time on assembly techniques that provide installations that breeze
through strict quality assurance.

A thorough review of the valve control placements on a control module shall result in a neat and orderly layout. Open the access door on a side control module and peer inside. The horizontal

control rods appear neat and orderly. The appearance is only a portion of the requirement. The same neat and orderly appearance after countless hours of engineering design and ergonomic study provide a smooth trouble-free linkage for valve operation. Another byproduct of the low-profile control rod placement is the ability to offer ladder through the tank storage designs.

On a top control module mount valve controls are attached to the valves through high performance stainless steel aircraft type cable assemblies. Cables eliminate the inefficiencies of control rods connected to a valve. Operate a cable controlled top panel and you will feel the difference; smooth and precise across the full valve operation.

The gauge panel door shall be an expansive double wall stainless door supported by a 3/8-inch diameter hinge pin. The double wall door provides unsurpassed strength and gauge protection while thwarting the casual attempt of tinkering. Authorized servicing of the components within the door is simplified with a bolt on access panel.

Inside the access door; there shall be a clean well build appearance. Stainless steel piping, stainless steel panels, and a stainless-steel framework all to provide years of trouble free service. Pipe threads are not allowed on plumbing larger than 1-1/2 inch in diameter. The pump module design shall employ Victaulic coupling connections in the pump module to save time when servicing a component. Installation of components without the use of pipe threads allows for “drop-out” maintenance of critical components without disassembly of entire piping systems. Drop in valves and manifolds with Victaulic couplings are only the start of the serviceability designed into this pump module.

Apparatus taking exception to any portion of this requirement will not be acceptable.

PUMP COMPARTMENT

The pump compartment shall be separate from the hose body and compartments so that each may flex independently of the other. It shall be a fabricated assembly of stainless steel tubing, angles and channels, which does not support the fire pump and or running boards. The pump compartment shall be mounted onto the chassis through rubber biscuits in a four point pattern to allow for a chassis frame twist.

Pump compartment, pump, plumbing and gauge panels shall be removable from the chassis in a single assembly and shall have an approximate width of 47". The pump compartment shall be a modular design.

A stainless-steel framework shall provide the support for the mounting of the pump lower panels. Stainless steel structure shall be provided as a support behind all control push-pull handles enabling a firm foundation for operation of the valve control.

An upper framework shall encompass the crosslay hose bed and walk way area for operation of the deck gun. The floor of this section shall be a bolt-on design to provide access for major repairs and or service.

RUNNING BOARDS

The running boards shall be separate from the hose body, compartments, and pump compartment so that each may flex independently of the other and to allow water to flow freely away from the running board area. Separation of the running boards and support structure from the hose body, compartments and pump compartment is desired to provide field service
of the running board without major repairs to the pump compartment in the event of an accident.

The steel running board supports shall be bolted directly to the chassis frame rails to provide proper support. The running board step surface shall be covered in Laser Grip stainless steel meeting the current revision of NFPA 1901 for step requirements.

RUNNINGBOARD LIGHTING

Two (2) LED armor protected, strip lights shall be provided one (1) each side of the pump module mounted to the underside of the runningboard(s). The LED shall be white in color and be activated with the vehicle ground light circuit.

DUNNAGE COMPARTMENT OVER PUMP

There shall be a dunnage compartment furnished on top of the pump module. The floor shall be bolted in place and removable for access to the fire pump components for major service.

DUNNAGE COMPARTMENT GRABRAILS

Two (2) bright anodized extruded aluminum grab rails shall be provided, one (1) each side of the pump house on the side of the dunnage compartment just below the top edge mounted horizontal to provide easy access to the dunnage
compartment. Molded rubber gaskets shall be installed under the grab handles to protect the surface of the compartment.

PUMP COMPARTMENT WORK LIGHT

The pump compartment shall have one (1) 36" long white LED strip light provide illumination of the pump compartment. The light strip shall be mounted transverse at the rear of the pump module with the light directed to the front. The light shall have a weather resistant, toggle style on/off switch located inside the pump compartment adjacent to the door hinge
area. The power for the pump module light shall be switched thru the battery master switch.

REMOVABLE FRONT PUMP COMPARTMENT PANEL

A removable brushed stainless-steel panel shall be provided on the front of the pump module. The panel shall be held in place by two D-ring latches at the top of the panel.

PUMP SERVICE ACCESS REQUIREMENTS

It is the opinion that service access to the pump, valves, gauges and controls are of the utmost importance. Special consideration shall be taken when evaluating the pump module design of the offeror. Pump panels that offer little to no access without the use of tools shall not be considered compliant with this requirement.

PUMP CONTROL PANELS

All pump controls and gauges shall be located at the left (street) side of the apparatus and properly identified. The layout of the pump control panel shall be ergonomically efficient and systematically organized. The pump operator's panel shall be removable in two (2) main sections for ease of maintenance. The pump and gauge panels shall be constructed of 12-gauge stainless steel. The gauge panel shall contain a panel for mounting of all instruments, engine monitoring system, and pressure control system.

The gauge panel shall be a double panel door design to protect in the enclosed door all gauge tubing, switch, and control wiring. The gauge panel exterior shall be made of 12-gauge stainless steel. The inner pan shall bolt onto the stainless exterior panel. There shall be an access panel in the inner panel easily removable for control or gauge service or replacement.

The gauge panel door shall be designed as an opening pump house service door on the street (left) side of the pump house. This gauge panel door shall provide an opening minimum size of 41 inches wide by 14 inches in height.

The lower section of the panel shall contain all inlets, outlets, and drains. All push-pull valve controls shall have quarter turn locking control rods with chrome plated zinc tee handles. Guides for the push-pull control rods shall be chrome plated zinc castings securely mounted to the pump panel. Push-pull valve controls shall be capable of locking in any position.
The control rods shall pull straight out of the panel and shall be equipped with universal joints to eliminate binding.

There shall be an opening pump house service door on the curb (right) side of the pump house. This door shall provide an opening minimum size of 41 inches wide by 14 inches in height.

PUMP PANEL IDENTIFICATION TAGS

The identification tag for each valve shall be recessed in the face of the control handle. All discharges shall have color-coded metal identification tags, with each discharge having its own unique color scheme. Color-coding shall include the labeling of the outlet and the drain for each corresponding discharge.

PUMP PANEL FINISH

All stainless panels used in the construction of the pump house shall have a brushed finish.

CONTROLS AND GAUGES

The following shall be provided on the pump and gauge panels in a neat and orderly fashion. The gauge panel shall include the following:

PRESSURE GOVERNOR, MONITORING, and MASTER PRESSURE DISPLAY

Fire Research InControl series TGA400-A00 pressure governor and monitoring display kit shall be installed. The kit shall include a control module, intake pressure sensor, discharge pressure sensor, and cables. The control knob shall be 2" in diameter with no mechanical stops, have a serrated grip, and a red idle push button in the center. It shall not extend more than 1-3/4" from the front of the control module. Inputs for monitored information shall be from a J1939 databus or independent sensors. Outputs for engine control shall be on the J1939 databus or engine specific wiring.

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

The dot-matrix message display shall show diagnostic and warning messages as they occur. It shall show monitored apparatus information, stored data, and program options when selected by the operator. All LED intensity shall be automatically adjusted for day and night time operation.

The program shall store the accumulated operating hours for the pump and engine to be displayed with the push of a button. It shall monitor inputs and support audible and visual warning alarms for the following conditions:

High Battery Voltage
Low Battery Voltage (Engine Off)
Low Battery Voltage (Engine Running) High Transmission Temperature
Low Engine Oil Pressure
High Engine Coolant Temperature Out of Water (visual alarm only)
No Engine Response (visual alarm only)

The program features shall be accessed via push buttons and a control knob located on the front of the control panel. There shall be a USB port located at the rear of the control module to upload future firmware enhancements.

Inputs to the control panel from the pump discharge and intake pressure sensors shall be electrical. The discharge pressure display shall show pressures from 0 to 600 psi. The intake pressure display shall show pressures from -30 in. Hg to 600 psi.

The governor shall operate in two control modes, pressure and RPM. No discharge pressure or engine RPM variation shall occur when switching between modes. A throttle ready LED shall light when the interlock signal is recognized. The governor shall start in pressure mode and set the engine RPM to idle. In pressure mode the governor shall automatically regulate the discharge pressure at the level set by the operator. In RPM mode the governor shall maintain the engine RPM at the level set by the operator except in the event of a discharge pressure increase. The governor shall limit a discharge pressure increase in RPM mode to a maximum of 30 psi. Other safety features shall include recognition of no water conditions with an automatic programmed response and a push button to return the engine to idle.

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

PRESSURE GAUGES

Each line pressure gauge shall be mounted immediately above the control for the corresponding valve. The individual line *pres*sure gauges for the discharges shall be 2-1/2" in diameter with white dial face gauges with black lettering and markings. The gauges shall be a compound style gauge with a vacuum/pressure range of 0 - 400 psig.

The gauges shall be fluid filled with pulse and vibration dampening Interlube to lubricate the internal mechanisms to prevent lens condensation and to ensure proper operation to -40 degrees F. The cases shall be temperature compensated with an internal breathing diaphragm to permit fully filled cases and to allow a rigid lens with a distortion free viewing area. The gauge accuracy for the gauge shall be plus or minus 2% mid-scale, plus or minus 3% balance, per ANSI B40.1, Grade 1A.

To prevent internal freezing and to keep contaminants from entering the gauge, the stem and bourdon tube shall be filled with low temperature oil and be sealed from the water system using an isolating diaphragm located in the stem. A bright metal bezel shall be supplied for resistance to corrosion and to protect the lens and case from damage.

All line pressure gauges shall be mounted adjacent to the corresponding discharge control tee handles.

LED GUAGE LIGHTING

The 2-1/2" pressure gauges shall be equipped with LED back lighting.

PUMP PANEL LIGHTING

The pump operator's panel shall be supplied with a LED light system. LED strip lights with a stainless-steel hood shall be mounted across the top of the pump panel gauges and controls.

LED strip lights with a stainless-steel hood shall be provided on each side of the pump module above the side panels.

All pump module lighting shall illuminate when the parking brake is engaged. There shall be a white/red color selector switch in the cab that controls the color of this lighting.

DRAIN DISCHARGES

The 3/4-inch drain valves shall be equipped with 90-degree fittings to direct the discharge water beneath the pump module away from the pump operator's panel.

AIR HORN ACTIVATION SWITCH

A switch shall be located on the pump panel to activate the chassis air horn. The switch shall be a momentary pushbutton type switch with a red cover. The switch shall be supplied with the proper identification label.

WATER TANK INDICATOR

Fire Research TankVision 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 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 aluminum, 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, and a data link 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 place on the interior of the tank. Wiring shall be weather resistant and have automotive type plug-in connectors.

PUMP MANUFACTURER AND MODEL

The pump shall be a Hale Q-MAX model midship pump.

PUMP CONSTRUCTION AND ASSEMBLY

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

The pump body and related parts shall be of fine grain alloy cast iron, with a minimum tensile strength of 30,000 PSI (207 MPa). All metal moving parts in contact with water shall be of high quality bronze or stainless steel. Pump utilizing castings made of lower tensile strength cast iron not acceptable.

Pump body shall be horizontally split on a single plane in two sections for easy removal of entire impeller assembly including wear rings and bearings from beneath the pump without disturbing piping or the mounting of the pump in chassis. The pump shall have one double suction impeller. The pump body shall have two opposed discharge volute cutwaters to eliminate radial unbalance.

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

Pump impeller shall be hard, fine grain bronze of the mixed flow design; accurately machined and individually balanced. The vanes of the impeller intake eyes shall be of sufficient size and design to provide ample reserve capacity utilizing minimum horsepower. Impeller clearance rings shall be bronze, easily renewable without replacing impeller or pump volute body, and of wraparound double labyrinth design for maximum efficiency. No exceptions.

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

Gearbox – G Gearbox

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

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

All gears, both drive and pump, shall be of highest quality electric furnace chrome nickel steel. Bores shall be ground to size and teeth integrated and hardened, to give an extremely accurate gear for long life, smooth, quiet running, and higher load carrying capability. An accurately cut spur design shall be provided to eliminate all possible end thrust. (No exceptions.)

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

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

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

PUMP RATING AND TEST REQUIREMENTS

The pump shall be of a size and design to mount on the chassis rails of commercial and custom truck chassis, and have the capacity of 1500 gallons per minute (U.S. GPM), NFPA 1901 rated performance. The pump shall deliver the percentage of rated discharge at pressures indicated below:

100 percent of rated capacity at 150 pounds net pressure 70 percent of rated capacity at 200 pounds net pressure 50 percent of rated capacity at 250 pounds net pressure 100 percent of rated capacity at 165 pounds net pressure

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

ALTITUDE REQUIREMENTS

The apparatus shall be designed to meet the specified rating at 0 to 2000' altitude.

PUMP COOLING LINE

A 3/8" cooling line shall be installed to recirculate water from the pump back through the pump transfer case, to cool the pump during prolonged pumping operations. The cooling line shall be controlled at the operator's position with a Class 1 valve.

AIR PRIMER

The pump shall be furnished with an air driven venturi priming system. The system shall be plumbed to the chassis air. A switch to control the air primer shall be provided on the pump operator's panel.

PNEUMATIC PUMP SHIFT

The pump shift shall be air operated and shall incorporate an air double action piston to shift from road to pump and back. A manual or electric operated pump shift mechanism is not acceptable. The pump shift switch shall be mounted in the cab and identified as "AIR PUMP SHIFT" and include instructions permanently inscribed on the pump shift switch plate. The in-cab operating valve uses a spring-loaded locking collar to prevent it from accidentally being moved.

The pump shift control assembly shall incorporate an indicating light system, which will notify the operator when the shift has been completed to PUMP and when the chassis transmission is in correct pumping gear.

The switch that activates the lights must be mounted on the pump transmission and positioned so that the pump shift arm activates the switch only when the shift arm has completed its full travel into PUMP position. An additional indicator light shall be provided adjacent to the throttle control at the pump operator's panel to indicate a completion of the pump shift.

MECHANICAL SEAL

The fire pump shall be provided with a mechanical pump seal. One (1) only required on the suction, inboard, side of the pump. The mechanical seal shall be two inches in diameter and shall

be spring loaded, maintenance free and self-adjusting. Mechanical seal construction shall be a carbon sealing ring, stainless steel coil spring, Viton rubber boot,
and a tungsten carbide seat with Teflon backup seal.

ANODE SYSTEM

To reduce the effect of galvanic action the pump shall be equipped with two alloy (2) anodes. One anode is to be installed on the inlet (suction) side of the system and one anode is to be installed on the pressure (outlet) side of the system.
The anode brass cap is to be drilled with a 1/8" diameter hole to provide an indicator when the anode alloy element is to be replaced.

THERMAL PROTECTION

The pump shall be equipped with a TRV-L, thermal protection device, which monitors the water temperature of the pump and relieves water when the temperature inside the pump exceeds the preset value of the relief valve (120 degrees F / 49 degrees C).

The TRV shall automatically dump a controlled amount of water to the atmosphere or back to the tank when the pump water temperature exceeds the preset value. The valve shall automatically close when the water temperature cools to below the preset value.

An aluminum composite panel placard with a visual warning lamp and test button shall be provided on the operator's panel. The warning light shall illuminate when the Thermal Relief Valve is open and discharging water.

SUCTION PRESSURE RELIEF VALVE

Task Force Tips model #A1820 pressure relief valve shall be provided. The valve shall have an easy to read adjustment range from 90 to 300 PSI in 90, 125, 150, 200, 250, 300 PSI increments. For corrosion resistance the cast aluminum valve shall be hardcoat anodized with a powder coat interior and exterior finish. The valve shall be configured for either a Waterous or Hale pump, and have a 2" male NPT threaded discharge outlet. The unit shall be covered by a five-year warranty.

The discharge side of the intake relief valve shall be plumbed to the right side below the running boards, away from but, visible to the pump operator, and shall terminate with an unthreaded pipe. The adjustment control shall be located behind the street side pump panel.

MASTER DRAIN

The apparatus shall be equipped with a Class 1 Manual Master Pump Drain for draining of the lower pump cavities, volute and selected water-carrying lines and accessories. The all brass and stainless-steel construction allows for operation up to 600 psi.

PUMP CERTIFICATION TEST

The pump shall undergo pump test with line and/or low voltage requirements of NFPA 1901 prior to delivery of the completed apparatus. The certificate shall be furnished with the apparatus on delivery.

FIRE PUMP WARRANTY

Standard 5-year warranty (Parts and Labor for the first two years, parts only years 3 - 5) See Hale warranty for full details.

ELECTRONIC PUMP MANUALS

Two (2) sets of electronic fire pump service and operation manuals shall be provided with the completed apparatus.

LEFT SIDE STEAMER INLET

There shall be one (1) steamer inlet furnished on the left side pump panel. The suction inlet shall have 6" NST thread. The suction inlet shall have a removable strainer provided inside the external inlet.

LARGE DIAMETER CAP

A six (6) inch chrome plated cap with long handles shall be supplied. The cap shall be capable of withstanding 500 PSI and be trimmed with the apparatus manufacturer's logo in the center of the cap.

RIGHT SIDE STEAMER INLET

There shall be one (1) steamer inlet furnished on the right-side pump panel. The suction inlet shall have 6" NST thread. The suction inlet shall have a removable strainer provided inside the external inlet.

LARGE DIAMETER CAP

A six (6) inch chrome plated cap with long handles shall be supplied. The cap shall be capable of withstanding 500 PSI and be trimmed with the apparatus manufacturer's logo in the center of the cap.

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GATED FRONT SUCTION

A front suction intake shall be provided. Suction pipe shall be Schedule 40, 5" ID in size, and shall be provided with quarter-turn bronze flange mounted drain valves at all low points of the line. The front suction shall be bolted to the pump and be assembled with a minimum of two (2) heavy duty Victaulic type couplings.

SUCTION MID DRAIN VALVE

An Akron Brass Style 7, 3/4" Drain Valve item 00070001 with brass handle shaft and body shall be installed in the mid-section of the front intake pipe. The small and compact drain valve shall be made of brass and have 3/4" NPT female inlet and outlet thread.

The push-pull control shall be extended to the side of the apparatus beneath the running board area. There shall be a tag adjacent to the control labeled 'DRAIN'.

ELECTRICALLY OPERATED SUCTION VALVE

The suction valve shall be electrically operated and have control switch at the pump operator's panel. The power valve operating mechanism shall prevent movement of the valve from the fully closed position to the fully open position or vice versa, in less than three (3) seconds. The control switch shall have a colored identification label. There shall be a three light indicator provided with one (1) green, one (1) yellow and one (1) red LED to indicate the valve position.

LEFT SIDE INTAKE

There shall be an intake located on the left (street) side rear of the pump and shall contain:

A 2-1/2" intake shall be provided. The inlet shall have a 2-1/2" quarter-turn swing-out valve. The inlet shall be provided with a 2-1/2" NST female swivel that extends through the pump panel.

The inlet valve shall have a push-pull type control handle located adjacent to the valve.

One (1) 2-1/2" chrome plated rocker lug plug with chain shall be supplied.

LEFT SIDE DISCHARGE #1

The forward discharge on the left (street) side of the pump panel shall contain:

A 2-1/2" discharge shall be provided. The discharge outlet shall have a 2-1/2" quarter-turn swing-out valve. The discharge shall be provided with chrome plated 30-degree discharge elbow with 2-1/2" NST male threads that extends through the pump panel.

DISCHARGE CAP

One (1) chrome plated, Class 1, 2-1/2" rocker lug cap with lug vent and chain shall be furnished.

LEFT SIDE DISCHARGE #2

The second from the forward discharge on the left (street) side of the pump panel shall contain:

A 2-1/2" discharge shall be provided. The discharge outlet shall have a 2-1/2" quarter-turn swing-out valve. The discharge shall be provided with chrome plated 30-degree discharge elbow with 2-1/2" NST male threads that extends through the pump panel.

DISCHARGE CAP

One (1) chrome plated, Class 1, 2-1/2" rocker lug cap with lug vent and chain shall be furnished.

RIGHT SIDE DISCHARGE #3

The forward discharge on the right (curb) side of the pump panel shall contain:

A 2-1/2" discharge shall be provided. The discharge outlet shall have a 2-1/2" quarter-turn swing-out valve. The discharge shall be provided with chrome plated 30-degree discharge elbow with 2-1/2" NST male threads that extends through the pump panel.

DISCHARGE CAP

One (1) chrome plated, Class 1, 2-1/2" rocker lug cap with lug vent and chain shall be furnished.

RIGHT SIDE DISCHARGE #4

The second from the forward discharge on the right (curb) side of the pump panel shall contain:

A 3" discharge shall be provided. The discharge outlet shall have a 3" quarter-turn swing-out valve. The discharge shall be provided with chrome plated 30-degree discharge elbow with 3" NST male threads that extends through the pump panel.

DISCHARGE CAP

One (1) chrome plated, Class 1, 3" rocker lug cap with lug vent and chain shall be furnished.

REAR PRECONNECT - RIGHT SIDE

There shall be one (1) 2-1/2" discharge outlet located on the passenger side rear of the body below the hose bed. The discharge outlet shall be plumbed with 2-1/2" ID, Schedule 40 stainless steel pipe and high-pressure hose and have a 2-1/2" quarter-turn, swing out valve with control on pump operator's panel. There shall be a chrome plated 2-1/2" NST adapter that extends through the rear of the body. The discharge shall be provided with a chrome plated 30-degree discharge elbow.

TANK REAR INTAKE/DISCHARGE SLEEVE

The water tank shall be provided with one (1) 4" sleeve from the front of the tank to the rear of the tank. The sleeve shall provide access for either rear intake or rear discharge piping.

DISCHARGE CAP

One (1) chrome plated, Class 1, 2-1/2" rocker lug cap with lug vent and chain shall be furnished.

FRONT JUMPLINE

A 1-1/2" discharge shall be located at the front bumper. The front discharge shall be plumbed using 2" stainless steel pipe and wire reinforced high pressure hose coupled with stainless steel fittings. The front discharge outlet shall have a 2" quarter-turn swing out valve with control on pump operator's panel. The front discharge shall be provided with a 1-1/2" polished stainless steel, 90-degree swivel adapter with 1-1/2" NST male outlet.

FRONT JUMPLINE AIR BLOW OUT

An air blows out system shall be provided for the front jumpline. Air from the chassis air system shall be utilized, with controls mounted on the pump operator's panel.

The jumpline swivel shall be located on top of the gravelshield adjacent to the hosewell.

VALVE CONTROL

The discharge valve shall be a 2" swing out type. Control of the valve shall be accomplished using a manual locking control on pump operator's panel.

AUTOMATIC DRAIN VALVE

One (1) Class 1, 3/4" automatic drain valve shall be supplied.

DISCHARGE CAP

One (1) chrome plated, 1-1/2" rocker lug with vented lug with chain shall be furnished.

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DELUGE RISER

A 3" diameter deluge riser shall be installed above the pump. The deluge outlet shall be plumbed with a 3" quarter-turn, swing out valve and 3" ID, Schedule 40 stainless steel piping. Deluge outlet shall have control on pump operator's panel.

DRAIN VALVE

A 1/4 turn drain valve shall be installed. The valve shall be brass with 3/4" NPT female inlet and outlet thread.

The deluge piping shall terminate with an NPT male thread. A cap plug is to be provided on the end of the piping to protect the threads if no deck gun is installed at the factory.

DECK GUN CONTROL - MANUAL VALVE

The 3" discharge outlet shall have a 3" slow close quarter-turn swing out valve. The discharge shall be plumbed with 3" Schedule 40 stainless steel piping with 3" NPT male thread. Control of outlet shall be accomplished using a manual, locking control on pump operator's panel.

PUMP DUNNAGE AREA DIMENSIONS

The area behind of the crosslays shall be the dunnage area of the pump house. This area is where the deckgun riser if so equipped protrudes above the pump module. This area shall be enclosed with approximate dimensions of 68" wide x 19" deep x 32.25" front to back.

DOUBLE CROSSLAY HOSEBED

The crosslays shall be arranged on top of the pump module with the #1 crosslay toward the front of the pump house and the #2 crosslay immediately behind the first.

#1 CROSSLAY - DOUBLE STACK

The #1 crosslay shall be equipped with a 1-1/2" male NST outlet. The crosslay shall be plumbed with 2" Schedule 40 stainless steel high pressure pipe. A 2" quarter turn ball valve shall be used to control water flow. The outlet shall be equipped with a 2" polished stainless steel 90-degree swivel with 1-1/2" male NST thread located in the hosebed.

This crosslay bed shall be capable of carrying a minimum of two hundred feet (200') of 1-3/4" double jacketed hose. The double stack crosslay hosebed shall have inside dimensions of 8" wide x 19" tall x 72" wide.

The crosslay valve control shall be mounted on the operator's panel.

DRAIN VALVE

A 1/4 turn drain valve shall be installed. The valve shall be brass with 3/4" NPT female inlet and outlet thread.

CROSSLAY DIVIDER

A crosslay divider shall be provided between the #1 and #2 crosslay. The divider shall be constructed from 1/4" thick abraded aluminum plate mounted on a base T-extrusion that provides lower support the length of the divider. There shall be a hand hole on each side of the divider to assist the firefighter.

#2 CROSSLAY - DOUBLE STACK

The #2 crosslay shall be equipped with a 1-1/2" male NST outlet. The crosslay shall be plumbed with 2" Schedule 40 stainless steel high pressure pipe. A 2" quarter turn ball valve shall be used to control water flow. The outlet shall be equipped with a 2" polished stainless steel 90-degree swivel with 1-1/2" male NST thread located in the hosebed.

This crosslay bed shall be capable of carrying a minimum of two hundred feet (200') of 1-3/4" double jacketed hose. The double stack crosslay hosebed shall have inside dimensions of 8" wide x 19" tall x 72" wide.

The crosslay valve control shall be mounted on the operator's panel.

DRAIN VALVE

A 1/4 turn drain valve shall be installed. The valve shall be brass with 3/4" NPT female inlet and outlet thread.

CROSSLAY HOSE GUIDES

Brushed stainless steel hose guides shall be provided on the left and right side of the crosslays.

CROSSLAY HOSEBED COVER

A vinyl coated nylon hosebed cover shall be provided over the crosslay hosebeds. The vinyl crosslay cover shall be Midnight Black in color.

ELKHART BALL VALVES

All discharge ball valves shall be Elkhart heavy duty swing out valve with stainless steel ball unless specified otherwise.

TANK TO PUMP

The tank to pump piping shall be capable of delivering water to the pump at a rate of five hundred (500) gallons per minute. This flow shall be sustained while pumping to a minimum of 80% of the certified tank capacity with the apparatus on level ground.

The tank to pump line shall run from the pump to the front face of the water tank and down into the tank sump. A rubber coupling shall be included in this line to prevent damage from vibration or chassis flexing. The tank to pump line shall be 3"
I.D. piping with a 3" ball valve.

TANK REFILL

A 2" tank refill line shall be provided using a 2" quarter-turn full flow ball valve controlled from the pump operator's panel with a manual locking handle. The tank refill shall be plumbed with high pressure flexible piping and high-pressure flexible piping stainless steel couplings.

HEAT EXCHANGER DISCHARGE

A gated discharge line shall be installed to provide water from the fire pump to the chassis supplied heat exchanger to assist in engine cooling during pumping operations. The heat exchanger line shall be controlled at the pump operator's panel with a Class 1 valve.

== Pumper Components & Equipment ==
WATER TANK CONSTRUCTION

The tank shall have a rated capacity in U.S. gallons, complete with lifetime warranty. The tank manufacturer shall mark the tank and furnish notice that indicates proof of warranty. The purpose of the notice is to inform department personnel who store or use the tank that the unit is under warranty.

The tank shall be constructed of 1/2” thick Polyprene & Mac226 sheet stock. This material shall be non-corrosive stress relieved thermoplastic, white in color and UV stabilized for maximum protection. The tank shall be of a special configuration and is so designed to be completely independent of the body and compartments. All exterior tank joints and seems shall be extrusion welded and/or contain the Bent Edge™ and tested for maximum strength and integrity. The top of the tank is fitted with removable lifting eyes designed with a 3-to-1 safety factor to facilitate easy removal.

The transverse and longitudinal swash partitions shall be manufactured of Polyprene & Mac226 material. 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 and meet NFPA rules. All swash partitions interlock with one another and are welded to each other as well as to the walls and floor of the tank.

TANK SUMP AND CONNECTIONS

There shall be one (1) sump standard per tank. The sump shall be constructed of white Polyprene & Mac226 and be located in the left front corner of the tank, unless specified otherwise. On all tanks that require a front suction, a schedule 40 polypropylene pipe shall be installed that will incorporate a dip tube from the front of the tank to the sump location. The sump shall have a minimum 3" FNPT threaded outlet on the bottom for a drain plug. This shall be used as a combination clean out and drain. All tanks shall have an anti-swirl plate located above the dip tube.

There will be two (2) standard tank outlets: one for tank to sump suction line, and one 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 of up to 1,000 GPM. The addition of rear suction fittings, nurse valve fittings, dump valve fittings, and through tank sleeves to accommodate rear discharge piping must be specified. All auxiliary outlets and inlets must meet N.F.P.A. 1900 guidelines in effect at the time of manufacture.

TANK MOUNTING

A tank mounting cradle shall be supplied. The tank mounting cradle shall consist of a minimum of seven (7) crossmembers and two (2) full tank length longitudinal members. The tank shall rest on the tank mounting subframe, and shall be insulated from the sub-frame with a 2-1/2" wide rubber insulator. The tank shall sit cradle-mounted using four (4) corner angles of 8" x 8" x 4" x . 250" welded directly to the tank sub-frame. The angles shall keep the tank from shifting left to right or front to rear. The tank is designed on the free-floating suspension principal and shall not require the use of hold downs. The tank shall be completely removable without disturbing or dismantling the apparatus body structure. The hosebed cross-braces shall act as water tank retainers. The water tank cradle shall be designed to be completely independent of the apparatus body to eliminate torsional stress loading in the body. No exception will be permitted to the tank mounting requirements.

The tank cradle shall be finish painted to match the chassis frame.

PURCHASE INTENT

The apparatus being purchased is expected to have an 18 to 20-year service life. Based on this requirement, the department is extremely concerned that the apparatus remains structurally sound

and the outward appearance remains in a “like new” condition, with minimal maintenance and upkeep, throughout the intended service life.

Aluminum apparatus bodies and differing construction designs will be reviewed and considered ONLY if the builder / manufacture provides in the respondent specifications adequate proof that procedures and materials employed in the design prevent corrosion over the intended service life. Burden of proof is on the bidder and final determination of acceptability will be solely determined by the department.

The entire body design shall be of a laser machined, bolted design to allow for ease of removal for repair or replacement, without cutting welds.

APPARATUS BODY DESIGN AND CONSTRUCTION

The apparatus body shall be built of stainless steel and shall be designed exclusively for Fire Service use. The overall body width shall be 100 inches wide and shall be constructed in accordance with current NFPA requirements. All metal work shall be free of sharp edges, objects or corners. No exceptions are allowed to this requirement.

The body design shall be fully tested with proven engineering and test techniques such as finite element analysis, stress coating, and strain gauging. Engineering and test techniques shall have been performed with special attention given to fatigue life and structural integrity of compartments and body support system.

The apparatus body shall be designed with the use of parametric modeling engineering software to ensure proper design of panel cuts and alignment of holes in mating parts. The entire apparatus body shall be a precision laser machined, bolted construction, properly reinforced with integral flanges eliminating the need for additional structural shapes. Hose body fabrications shall be free of all internal projections which might injure personnel or fire hose.

The pump module is to be completely separate from the main body to prevent damage due to flexing.

MODULAR BODY REQUIREMENTS

The body shall be completely modular in design allowing transfer of body components to a new chassis in the event of an accident or wear. Body components shall be removable from chassis without cutting or bending. The modular design shall also facilitate ease of repair or replacement of major or minor body parts. The mounting of the apparatus body shall be separate and distinct from the water tank mounting and the pump module mounting.

All body panels are to be laser machined on a CAM controlled laser to ensure accuracy (+/- . 010"). This shall greatly enhance assembly and matching of repair parts. The body compartment floors, rear walls and roof areas shall be constructed of 12-gauge austenitic stainless steel. The vertical front and rear walls are designed with 14-gauge stainless steel. These front and rear walls are designed as a structural beam with the inclusion of the design encompassing a front and rear design that allows for installation of telescoping lights.

Interior and unexposed stainless-steel panels shall be #4B finish to eliminate the need for high maintenance painted surfaces in the compartments. All exterior stainless-steel panels shall have #4B finish.

The entire body shall be fabricated using precision holding fixtures to ensure accurate dimensions. Body front and rear vertical flanges shall be triple broken, providing a mounting area for rear hand rails. Major body components shall consist of right and left body sides, and rear facing compartments.

The front and rear vertical corners of the apparatus body shall be recessed to provide a mounting area for vertical hand rails and telescoping light poles. Two (2) handrails shall be provided at the left and right sides of the apparatus body mounted vertically. A full width handrail shall be mounted at the rear of the body below the hosebed.

COMPARTMENT ROOF CONSTRUCTION

Each compartment top shall have a bolt in 12-gauge stainless roof section for supporting roof loads of up to 500 pounds per square foot without permanent roof deformation. The stainless roof sections shall attach the compartment rear wall and compartment vertical sides through a fastened joint creating a full perimeter compartment attacnt of the stainless roof section.

REAR FRAME EXTENSION

The rear chassis frame extension system shall consist of an interwoven dual .625" thick steel drop frame extensions with a transverse 4" x 3" x .375" thick structural channel, and dual laminated .188" thick rear compartment and tailboard support tapered angles on each side of apparatus.

The rear frame extension shall be bolted to the chassis frame utilizing Grade 8 bolts and Grade C locknuts with hardened washers. For ease in replacement of damaged components in an accident there shall be no welding of components to the chassis frame.

Two (2) tow eyes with an eye diameter of not less than 3.5" shall be attached directly to the chassis frame extensions. The tow eyes shall be fabricated of .625" thick steel.

BODY MOUNTING SYSTEM

The front body support system shall be an integral design with .250" thick steel deep section cross member across the top of the chassis frame. The deep section cross member shall be attached to the right side and the left side lower front compartment weldments with eight (8) grade 8; 3/8-inch diameter bolts on each side of the apparatus. The front cross member shall be attached to the chassis by means of an elastomer spring mounting system with limited travel.

The lower portion of this spring mounting system shall be an integral part of the pump module frame mounting system. This design allows for maximum chassis flexing without undue stress transfer to the apparatus body.

The right and left side rear compartments shall be attached to a stainless-steel rear body support. The stainless-steel support shall be attached to the chassis frame extensions by means of an elastomer spring mounting system to form a modular integral body support system.

The apparatus body shall not rest upon the chassis truck rails and must be separated entirely from the steel frame of the chassis to prevent galvanic action.

Loose fitting u-bolt body mounting systems are not acceptable due to the likeliness of the apparatus body shifting or becoming detached from the chassis upon rear end impact.

COMPARTMENT INTERIOR FINISH

For better interior visibility, to reflect light better, ease of maintenance and prevent the masking of poor welds and questionable workmanship the interior of the body compartments shall remain uncoated.

EXTERIOR ROOF FINISH

The top of the compartments shall be brushed stainless steel. The roof shall contain 'Not a Stepping Surface' labeling.

REAR TAILBOARD

A rear tailboard 12" deep shall be provided at the rear from "Laser Grip" stainless steel meeting NFPA 1901 step requirements. The tailboard shall provide protection for the side body compartments and shall provide mounting for the rear ICC marker lights. It shall be bolted to the rear support structure.

CHASSIS FRAME EXTENSIONS

There shall be a rear chassis drop frame extension to provide frame support for the rear of the apparatus body. This extension is to be bolted to the truck chassis as an integral part of the truck frame assembly and is to include rear tow eyes, crossmember and tailboard reinforcement.

The rear frame extension shall be hot dip galvanized for corrosion resistance.

20 YEAR TANK FRAME EXTENSION CORROSION WARRANTY

The rear frame extension shall have a warranty covering structural failure due to corrosion perforation. This warranty shall be in effect for 20 years after delivery of the apparatus to the end user.

COMPARTMENT DESIGN AND CONSTRUCTION

All compartments shall be manufactured from 12-gauge stainless steel with the vertical front and rear corner walls from 14-gauge, shall be of sweep out design and shall be bolted together. Stainless recessed round head bolts and stainless aircraft style "ESNA" nuts shall be applied with proper torque rating for each fastener. This type of construction shall greatly enhance the strength and ease of parts replacement in the event of damage and future modifications. Wherever possible, body bolts shall be hidden from plain view for appearance and ease of apparatus cleaning.

COMPARTMENT VENTILATION

Each compartment shall be provided with a laser cut louver to provide adequate ventilation.

VENT FILTRATION

There shall be filters provided for compartments L1, L3, R1, R3 and RR1. The protective louver covering the filer shall be removable to allow for filter changing.

The filter shall be 100% virgin nylon fiber in an open web design that is USDA approved. The filter shall be chemically treated with Dimethyl Benzyl Ammonium Saccharinate to aid in the reduction of bacteria and fungi.

7) 74"/74", FH/RD Ext Cmpts w/ThruTnk, TTnk, 1045 Gals, 63"HB

WATER TANK CAPACITY

The water tank shall be "T" shaped, with the upper portion of the tank being wider than the base and shall have a maximum capacity of 1045 US gallons.

TANK LID & FILL TOWER

The tank shall have a combination vent and fill tower. The fill tower shall be constructed of 1/2" thick Polyprene & Mac226 and shall be a minimum dimension of 10"x 14" outer perimeter. The tower shall be located in the center front of the tank unless otherwise specified by the purchaser. The tower shall have a 1/4" thick removable Polyprene & Mac226; screen and a Polyprene & Mac226 hinged-type cover. Inside the fill tower, there shall be a combination vent overflow pipe. The vent overflow shall be a minimum of schedule 40 pipe with a minimum ID of 4" that is designed to run through the tank, and shall be piped behind the rear axle beneath the tank.

The tank cover shall be constructed of recessed 1/2" thick Polyprene & Mac226, stress relieved, UV stabilized material. A minimum of two lifting dowels shall be drilled and tapped to accommodate the lifting eyes.

OVERFLOW AND VENT PIPE

The fill tower shall be fitted with an integral 4" ID, Schedule 40 PVC combination overflow/vent pipe running from the fill tower through the tank to a 4" coupling flush mounted into the bottom of the tank to allow water to overflow beneath the chassis.

BODY MODULE CAPACITIES AND HOSEBED HEIGHT

The total capacity of the body module exterior compartments shall be 159 cubic feet. The total capacity of the body hosebed shall be approximately 74 cubic feet.
The hosebed shall be approximately 63" from the bumper. The body shall have an overall length of 148".
Hosebed, Double High Side Pumper Body - Ladders Thru & Beam

APPARATUS BODY HOSEBED WITH 17" SIDES

The hosebed shall be constructed in such a manner that will prevent damage to fire hose. The hosebed shall comply with the current NFPA requirements. The interior of the hosebed shall be free of projections such as nuts, sharp edges or brackets that may damage hose. The hosebed and walls shall be manufactured from stainless steel. No exceptions to
this requirement is allowed.

An aluminum extrusion shall be installed over the rear opening of the hosebed to protect the body from wear. The hosebed bottom shall be fitted with removable slatted, ribbed 6" heavy-duty extruded aluminum floorboards.

ADJUSTABLE HOSE BED DIVIDERS

Two (2) adjustable hosebed dividers shall be provided. Each divider shall be fabricated from . 250" thick smooth aluminum plate, 5052-H32 alloy. The rear end of each divider shall have a 3" radius corner and shall be sanded and deburred to prevent damage to hose.

There shall be two hand hold openings provided. One (1) at the rear in a vertical position and one (1) approximately 24 inches in from the rear in a horizontal position.

HOSEBED COVER

A black vinyl hosebed cover shall be provided and designed to cover the entire main hosebed area. The cover shall be
installed with "stretch cord type" fasteners along each side of the hosebed. A sand filled flap shall be incorporated into the rear edge of the cover.

The hosebed cover rear flap shall have a positive locking device to meet the requirements of NFPA.

LEFT SIDE COMPARTMENT DIMENSIONS

FORWARD OF WHEEL WELL

There shall be one (1) rescue style, full height, and split depth compartment ahead of the rear wheels. It shall have approximate dimensions of 48" wide x 63" high x 12" deep in the upper section and 24" deep in the lower section.

ABOVE WHEEL WELL

There shall be one (1) high side reduced depth compartment centered over the rear wheels. It shall have approximate dimensions of 52" wide x 33" high x 12" deep.

REAR OF WHEEL WELL

There shall be one (1) rescue style, full height, and split depth compartment behind the rear wheels. It shall have approximate dimensions of 43" wide x 63" high x 12" deep in the upper section and 24" deep in the lower section.

ROLLUP DOOR CONSTRUCTION - LEFT SIDE

All left side compartments shall be provided with Gortite roll up doors. The roll up doors shall be constructed of double sided aluminum extrusions connected with a ball and socket joint. The extrusions shall be 1-3/8" wide x 3/8" thick with satin anodized finishing. A flexible EDPM extrusion shall be provided between each slat to insure a weather tight seal. Aluminum

extrusions shall be individually replaceable without disassembling the entire door by removing push out clips on
each end.

Side channels for each door to ride in shall be provided with santoprene seals to prevent dirt and moisture from entering the exterior compartment. A single piece top drip rail shall be provided with a santoprene seal to prevent dirt and moisture from entering the compartment when the door is fully closed. The bottom of each door shall also be provided with a santoprene seal. All nonmetallic parts shall be glass filled nylon.

The left side door latches shall be non-locking stainless steel lift bars and shall be provided with a magnetic door ajar switch system.

FENDER SIDE SKIRTS

There shall be stainless steel fender side skirts located in the area of the rear wheels. The design of the fender sides shall be a minimal length to provide maximum compartment space in the apparatus.

FUEL FILL - SIDE BODY

The fuel fill shall be located in the rear fender area on the left side of the apparatus body. The spring-loaded fuel fill door shall have "Diesel Fuel" laser cut in the face of the door. There shall be a vent line from the fuel tank to beneath the fuel
cap to aid in fueling of the truck.

BODY FENDERS - POLISHED

The apparatus body fenders shall be made from 16-gauge polished stainless steel and shall be rolled, die stamped and fully removable. The stainless-steel fenders and stainless fender liners shall be fastened with stainless bolts and ESNA nuts to the outer fender panel.

REAR AXLE MUD FLAPS

Two (2) black, anti-sail, mud flaps shall be mounted behind the rear wheels.

SCBA BOTTLE COMPARTMENTS

Seven (7) SCBA bottle tube compartments shall be provided, three (3) in the left side rear wheel well area and four (4) in the right-side rear wheel area. Each compartment shall be constructed of gray roto molded storage compartment to provide SCBA scuff protection. A door seal shall be provided at the perimeter of the SCBA compartment. The doors shall be brushed stainless steel with a push button trigger latch.

SCBA BOTTLE RETENTION STRAP

One (1) one-inch (1") wide loop of red webbing shall be installed in each SCBA compartment to prevent the bottle from sliding out of the compartment in the event the door is not latched for travel. The loop shall be mounted, centered in the compartment and shall hang within one-inch (1") of the compartment floor to allow the bottle to pass by the strap when the bottle is placed in the compartment. The strap shall loop over the valve.

RIGHT SIDE COMPARTMENT DIMENSIONS

FORWARD OF WHEEL WELL

There shall be one (1) rescue style, full height, and split depth compartment ahead of the rear wheels. It shall have approximate dimensions of 48" wide x 63" high x 12" deep in the upper section and 24" deep in the lower section.

ABOVE WHEEL WELL

There shall be one (1) high side reduced depth compartment centered over the rear wheels. It shall have approximate dimensions of 52" wide x 33" high x 12" deep.

REAR OF WHEEL WELL

There shall be one (1) rescue style, full height, and split depth compartment behind the rear wheels. It shall have approximate dimensions of 43" wide x 63" high x 12" deep in the upper section and 24" deep in the lower section.

ROLLUP DOOR CONSTRUCTION - RIGHT SIDE

All right-side compartments shall be provided with Gortite roll up doors. The roll up doors shall be constructed of double sided aluminum extrusions connected with a ball and socket joint. The extrusions shall be 1-3/8" wide x 3/8" thick with
satin anodized finishing. A flexible EDPM extrusion shall be provided between each slat to insure a weather tight seal. Aluminum extrusions shall be individually replaceable without disassembling the entire door by removing push out clips on each end.

Side channels for each door to ride in shall be provided with santoprene seals to prevent dirt and moisture from entering the exterior compartment. A single piece top drip rail shall be provided with a santoprene seal to prevent dirt and moisture from entering the compartment when the door is fully closed. The bottom of each door shall also be provided with a
santoprene seal. All nonmetallic parts shall be glass filled nylon.

The right-side door latches shall be non-locking stainless steel lift bars and shall be provided with a magnetic door ajar switch system.

BODY RUBRAIL / LIGHTING SYSTEM

The apparatus body shall have a bolt on extruded, bright anodized aluminum rub rail affixed to the side beneath each door area. Each rub rail shall be attached to the apparatus body with standoff spacers made from 1" diameter UHMW Polyethylene bar stock.

The rubrail shall be designed with an integral white LED strip light. The white LED shall be downward facing and activated with the ground light circuit.

The rubrail design shall also include a red LED strip light. The red LED strip light shall face outward and activate as a red flashing warning light when the warning lights are active.

STAINLESS STEEL APPARATUS BODY PAINTED

The following apparatus body components shall be painted job color:

The rear wheel fender panels
The exterior surface of the hosebed side walls / coffin compartment the exterior surface of the hosebed / coffin compartment front wall

APPARATUS COMPARTMENT LIGHTING

Two (2) LED, armor protected, strip lights shall be provided one (1) each side of the compartment at the door frame for each body compartment. Each body door shall have an automatic compartment light switch.

There shall be a white/red color selector switch in the cab that controls the color of this lighting.

Rear - Center - RR1 Half Height - 63" 69" HB

REAR COMPARTMENT DIMENSIONS

There shall be one (1) half height compartment at the rear of the body. It shall have approximate dimensions of 48" wide x 29" high x 22" deep.

ROLLUP DOOR CONSTRUCTION - REAR

The rear compartment shall be provided with a Gortite roll up door that shall be constructed of double sided aluminum extrusions connected with a ball and socket joint. The extrusions shall be

1-3/8" wide x 3/8" thick with satin anodized finishing. A flexible EDPM extrusion shall be provided between each slat to insure a weather tight seal. Aluminum extrusions shall be individually replaceable without disassembling the entire door by removing push out clips on each end.

Side channels for the rear door to ride in shall be provided with santoprene seals to prevent dirt and moisture from entering the exterior compartment. A single piece top drip rail shall be provided with a santoprene seal to prevent dirt and moisture from entering the compartment when the door is fully closed. The bottom of the door shall also be provided with a santoprene seal. All nonmetallic parts shall be glass filled nylon.

The rear door latch shall be a non-locking stainless steel lift bar and shall be provided with a magnetic door ajar switch system.

REAR BODY REFLECTIVE CHEVRON STRIPING

The rear-facing vertical surfaces of the rear taillight panels and the area below the horizontal step, visible from the rear of the apparatus, including the rear compartment door(s), shall be equipped with six (6) inch wide retroreflective striping in a chevron pattern sloping downward and away from the centerline of the vehicle at an angle of 45 degrees.

Each stripe in the chevron shall be a single-color alternating between red (3M #-82) and yellow (3M # -81).

LADDER STORAGE TANK COMPARTMENT

The water tank shall have a storage opening through the tank for ladder storage inside the apparatus body. This compartment shall extend from the rear of the tank completely through the tank to allow the ladders to extend into the pump house for storage.

The compartment shall store one (1) 24' two-section ladder, one (1) 14' roof ladder, one (1) 10' folding ladder, up to three pike poles.

UPPER THRU TANK COMPARTMENT

There shall be a second thru tank storage area with inside dimensions of 9 inches high x 28 inches wide x through the end of the tank. This option reduces the water tank capacity by 150 gallons.

The multipurpose storage compartment above the ladders shall be large enough in which to safely store three (3) lengths of 6" suction hose or various long handled tools.

HINGED DOOR LADDER STORAGE - REAR

The rear through the tank compartment shall be provided with a horizontally hinged door with gas shocks and a polished stainless steel 1/4" piano hinge. The hinged compartment door shall be flush style so that the entire door fits flush against the apparatus body rear wall.

The door shall be provided with a turn latch with a chrome "D" ring door handle with a 5-degree bend for easier grasping of the door handle with gloved hands.

LIGHTING, REAR LADDER COMPARTMENT

The ladder compartment shall contain integrated LED lighting. The lighting shall be integrated into the horizontal hinge, directed toward the ladder storage. The assembly shall illuminate by opening the ladder compartment door.

The LED handrail lighting shall be white in color.

Thru the Tank Ladder Group - 10-Fold, 14-Roof, 24-2 Sec

ROOF LADDER

One (1) 14' Duo-Safety model 775-A, aluminum channel rail roof ladder with folding roof hooks shall be provided with the apparatus.

ATTIC LADDER

One (1) 10' Duo-Safety model 585-A aluminum folding attic ladder shall be provided with the apparatus.

EXTENSION LADDER

One (1) 24' two-section Duo-Safety model 900A solid beam, aluminum extension ladder shall be provided with the apparatus.

INTERMEDIATE REAR STEP - UPPER FULL WIDTH

An NFPA #1901 compliant "Laser Grip" rear step shall be located just above the rear compartment and span the width of the hosebed. It shall be no less than 8" in depth and fabricated of stainless steel.

REAR WORK LIGHTS - LED

A recess mounted LED strip light with integral guard shall be supplied under the rear intermediate step.

The lights shall be shall be switched on when the parking brake is set and the apparatus is running with the master battery switch in the "ON" position.

REAR HORIZONTAL HANDRAIL

There shall be a ribbed, 1-1/4" diameter, aluminum handrail with chrome plated stanchions supplied and installed at rear of the apparatus body horizontally along the rear edge of the hosebed area.
Rear - Left Side - Egress Steps - one (1) folding step, lower (1) fixed step

FOLDING STEPS

There shall be one (1) folding step installed on the left rear of the body in the upper position.

The folding step(s) shall include an integrated LED light beneath each step. This light shall illuminate when the apparatus ground lights are activated. The bottom of the step and step mounting shall include white reflective material to aide in locating the step when the vehicle ground lights are not activated.

INTERMEDIATE REAR STEPS - LOWER LEFT SIDE

There shall be a rear corner step, on the left side, located adjacent to the rear compartment and shall be no less than 8" in depth and fabricated of "Laser Grip" stainless steel to meet NFPA #1901 step requirements.

REAR LEFT SIDE VERTICAL HANDRAIL

There shall be a 1-1/4" diameter, aluminum handrail with chrome plated stanchions supplied and installed on the upper left-hand side of the body inset at rear of the apparatus body.

Rear - Right Side - Egress Steps - upper (1) folding step, lower (1) fixed step

FOLDING STEPS

There shall be one (1) folding step installed on the right rear of the body in the upper position.

The folding step(s) shall include an integrated LED light beneath each step. This light shall illuminate when the apparatus ground lights are activated. The bottom of the step and step mounting shall include white reflective material to aide in locating the step when the vehicle ground lights are not activated.

INTERMEDIATE REAR STEPS - LOWER LEFT SIDE

There shall be a rear corner step, on the right side, located adjacent to the rear compartment and shall be no less than 8" in depth and fabricated of "Laser Grip" stainless steel to meet NFPA #1901 step requirements.

REAR RIGHT SIDE VERTICAL HANDRAIL

There shall be a 1-1/4" diameter, aluminum handrail with chrome plated stanchions supplied and installed on the upper right-hand side of the body inset at rear of the apparatus body.

FOLDING STEPS

Four (4) folding steps shall be provided on the front of the apparatus body. Steps shall be provided and installed per NFPA requirements.
The folding step(s) shall include an integrated LED light beneath each step. This light shall illuminate when the apparatus ground lights are activated. The bottom of the step and step mounting shall include white reflective material to aide in locating the step when the vehicle ground lights are not activated.

FOLDING STEPS

Two (2) additional folding steps shall be provided, one each side, on the front of the body. The steps shall be provided and installed per NFPA requirements.

The folding step(s) shall include an integrated LED light beneath each step. This light shall illuminate when the apparatus ground lights are activated. The bottom of the step and step mounting shall include white reflective material to aide in locating the step when the vehicle ground lights are not activated.

HOSEBED FLOODLIGHT

One (1) Maxxima MWL-36, 2100 Lumen LED hosebed floodlight with swivel and folding handle shall be mounted at the front right corner of the hosebed. There shall be a weather resistant switch on the light head. The light shall be activated with the parking brake.

LEFT FRONT QUARTZ LIGHT

The following light shall be provided mounted on the left front corner of the body:

Fire Research Spectra LED Scene Light model SPA100-Q20 lamphead shall be provided. The lamphead shall have eighty-four (84) ultra-bright white LEDs, 72 for flood lighting and 12 to

provide a spot light beam pattern. It shall operate at 12 volts DC, draw 18 amps, and generate 20,000 lumens of light. The lamphead shall have a unique lens that directs flood lighting onto the work area and focuses the spot light beam into the distance. The lamphead angle of elevation shall be adjustable at a pivot in the mounting arm and the position locked with a round knurled locking knob. The lamphead shall be no more than 5 7/8" high by 14" wide by 3 1/2" deep and have a heat resistant handle. The lamphead and mounting arm shall be powder coated. The LED scene light shall be for fire service use.

One (1) 12-volt, switch(es) shall be located in the cab switch panel. The switch(es) shall control the 12-volt quartz lighting fixture(s) as selected.

One (1) 12-volt, water proof switch(es) shall be located on the pump operator's panel. The switch(es) shall control 12-volt quartz lighting fixture(s) as selected.

The light head shall be mounted on a side mount push up telescopic pole. The light pole shall be anodized aluminum and have a knurled twist lock mechanism to secure the extension pole in position. The extension pole shall rotate 360 degrees. The outer pole shall be a grooved aluminum extrusion and qualify as an NFPA compliant handrail. The pole mounting brackets shall have a 3 1/2" offset. Wiring shall extend from the pole bottom with a 4' retractile cord.

RIGHT FRONT QUARTZ LIGHT

The following light shall be provided mounted on the right front corner of the body:

Fire Research Spectra LED Scene Light model SPA100-Q20 lamphead shall be provided. The lamphead shall have eighty-four (84) ultra-bright white LEDs, 72 for flood lighting and 12 to provide a spot light beam pattern. It shall operate at 12 volts DC, draw 18 amps, and generate 20,000 lumens of light. The lamphead shall have a unique lens that directs flood lighting onto the work area and focuses the spot light beam into the distance. The lamphead angle of elevation shall be adjustable at a pivot in the mounting arm and the position locked with a round knurled locking knob. The lamphead shall be no more than 5 7/8" high by 14" wide by 3 1/2" deep and have a heat resistant handle. The lamphead and mounting arm shall be powder coated. The LED scene light shall be for fire service use.

One (1) 12-volt, switch(es) shall be located in the cab switch panel. The switch(es) shall control the 12-volt quartz lighting fixture(s) as selected.

One (1) 12-volt, water proof switch(es) shall be located on the pump operator's panel. The switch(es) shall control 12-volt quartz lighting fixture(s) as selected.

The light head shall be mounted on a side mount push up telescopic pole. The light pole shall be anodized aluminum and have a knurled twist lock mechanism to secure the extension pole in

position. The extension pole shall rotate 360 degrees. The outer pole shall be a grooved aluminum extrusion and qualify as an NFPA compliant handrail. The pole mounting brackets shall have a 3 1/2" offset. Wiring shall extend from the pole bottom with a 4' retractile cord.

ALUMINUM TRAYS - PULL OUT

Four (4) heavy duty pullout trays shall be installed and shall be equipped with Grant slides and a gas shock to hold the tray in both the in and out positions and shall be made from .190" aluminum with a maximum capacity of 250 pounds.

Each heavy-duty pullout tray shall be installed as follows:

1. One (1) in compartment L1, L3, R1, R3.

ALUMINUM TOOL BOARDS

The upper half of the rear wall of six (6) exterior compartments shall be covered with FoxTrax aluminum extrusion tool mounting board.

Tool mounting boards shall be installed on the upper back wall of all side compartments.

TOOL BOX

A 20" long by 8" wide stainless-steel toolbox with a top removable tray shall be provided with the apparatus. The tool box shall be supplied with a logo of the truck manufacturer applied to the lower left front corner of the box.

APPARATUS BODY ELECTRICAL SYSTEM

All body electrical shall conform to NFPA 1901 latest edition standards. The apparatus shall be equipped with a heavy-duty 12-volt negative ground system.

All 12-volt apparatus wiring shall pass through a heavy-duty power disconnect solenoid. The 12-volt control of the power disconnect switch is to be triggered by the Master Battery Disconnect.

The apparatus shall be equipped with a Class1 Es-Key Management System for complete control of the electrical system devices.

The right rear compartment shall house a relay-based Power Distribution Module (PDM). The PDM shall contain 12 standard automotive relays. Each relay's output shall be monitored by the Es-Key system to provide true on/off feedback. Each output shall be capable of handling up to 30 amps and be protected by an automatic circuit breaker. The PDM shall be mounted on a

removable panel in the left rear compartment with sufficient harness length to allow a technician the
ability to remove the PDM and place it on a compartment shelf for diagnostics and service.

All wiring shall be color-coded and function coded to assist the technician in servicing the electrical system. All circuits
shall be divided and balanced for proper load distribution. Where possible, wiring shall be routed in looms as a single harness. Heat resistant convoluted loom shall be used. Only solderless, insulated crimp automotive electrical connectors shall be used.

CAB ICC MARKER LIGHTING

Five (5) amber Whelen OS Series LED cab face mounted clearance lights shall be supplied, mounted above the windshield. These lights are to be mounted in a chrome flange.

Two (2) amber Whelen OS Series LED side clearance lights shall be supplied, one (1) each side mounted ahead of the front door.

An amber diamond shaped reflector shall be mounted on the lower corner of each cab front door adjacent to the door hinge.

APPARATUS ICC MARKER LIGHTING

Two (2) amber Whelen OS Series LED side clearance lights shall be supplied, one (1) each side mounted ahead of the forward body compartment. These lights are to be mounted in a chrome flange.
Five (5) red LED clearance lights shall be supplied, mounted in the rear of the apparatus. Two (2) red LED clearance lights shall be supplied, mounted facing the side of the apparatus.
A red diamond shaped reflector shall be mounted on each lower rear corner of the apparatus body. ICC lighting utilized and lighting positions shall be in conformance with FMVSS 108.

HEADLIGHTS

Four (4) rectangular halogen headlights shall be supplied.

When the parking brake is released and the master battery switch is in the on position, the head lamps shall be illuminated to 80% brilliance.

TURN SIGNALS

Two (2) rectangular Federal Signal, model QL64Z-TURN, LED turn signal lamps shall be mounted outboard of the front headlights on each side. These lights shall be amber in color.

Bryan County Emergency Services
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(912) 858-2799 Office (912) 858-2599 Fax
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REAR STOP/TAIL/TURN/BACKUP LIGHTS

The rear of the apparatus shall be equipped with Whelen 600 Series lights. The top light in the assembly shall be a red LED stop/tail light, Whelen model C6BTT. The middle light set shall be an amber LED lamp with a populated arrow shape, Whelen model C6T.

The lower lights in the assembly shall be clear LED backup lights, Whelen model 60C00WCR. This light is selected for the maximum population of LED's in the backup light head.

A one-piece bright finished trim, Whelen PLAST3V, shall be mounted around the rear stop/tail/turn and backup lights on each side of the apparatus.

BACK-UP ALARM

A solid-state electronic backup alarm shall be installed on the rear of the apparatus and wired to the backup light circuit.

One (1) license plate mounting and LED light shall be provided. The light and bracket shall be located on the rear of the apparatus.

HEADLIGHT POSITION

The headlights shall be mounted in the upper position on the front of the cab to accommodate high profile front bumper items. The lower headlight position shall have a painted access cover to allow lighting changes in the future.

ROOF MOUNTED LIGHTBAR

A Whelen Freedom model F4N7QLED, 72" light bar system shall be supplied and permanently mounted on the cab roof, as far forward as possible. This light bar system shall be supplied with eight (8) LED elements, six (6) red and two (2) clear.

This light bar fulfills the requirements for Upper Zone A and in combination with the upper rear warning devices fulfills the requirements for Upper Zones B, C, and D. Any clear warning light(s) in the light bar shall be disabled automatically for the “Blocking Right of Way” mode.

LOW LEVEL WARNING LIGHTS

Two (2) Whelen warning lights, C6 SurfaceMax Series, Super-LED light heads shall be mounted on the front of the chassis above the headlights located in the inner position on each side.

The self-contained flashing light shall have 75 Scan-Lock™ flash patterns including steady burn with hi/low power. The C6LR will meet SAE J595 and J845 requirements.

These two (2) lights fulfill the requirements for Lower Zone A lower level warning devices.

Both warning light lenses shall be red in color.

LOW LEVEL WARNING LIGHTS

Two (2) additional Whelen warning lights, C6 SurfaceMax Series, Super-LED light heads shall be mounted on the front of the chassis above the headlights located in the outer position on each side.

The self-contained flashing light shall have 75 Scan-Lock™ flash patterns including steady burn with hi/low power. The C6LR will meet SAE J595 and J845 requirements.

These two (2) lights are in addition to the requirements for Lower Zone A lower level warning devices.

Both warning light lenses shall be red in color.

FRONT INTERSECTION LIGHTS

Two (2) Whelen warning lights, C6 SurfaceMax Series, Super-LED light heads shall be mounted one (1) on each side of the front bumper/gravelshield with a Whelen chrome plated flange.

The self-contained flashing light shall have 75 Scan-Lock™ flash patterns, steady-burn and Hi/Low power. The warning lights shall be programmed for Hi-power with the same flash pattern for both the right and left intersection light head.

These two (2) lights fulfill the requirements for Lower Zone B & D lower level warning devices. Both warning light lenses shall be red in color.

BODY SIDE WARNING LIGHTS

Two (2) Whelen warning lights, C6 SurfaceMax Series, Super-LED light heads shall be mounted one (1) on each side of the cab over the rear wheel with a Whelen chrome plated flange.

The self-contained flashing light shall have 75 Scan-Lock™ flash patterns including steady burn with hi/low power. The warning lights shall be programmed for Hi-power with the same flash pattern for both the right and left intersection light head.

These two (2) lights fulfill the requirements for Lower Zone B & D lower level warning devices. Both warning light lenses shall be red in color.

REAR UPPER LEVEL WARNING LIGHTS

Two (2) Whelen MCFLED2* warning lights shall be mounted on the rear of the apparatus one on each side of the hosebed on polished stainless-steel stanchions.

These two (2) lights fulfill the requirements for Upper Zones B, C & D upper level warning devices. Both warning light lenses shall be red in color.

REAR LOWER LEVEL WARNING LIGHTS

Two (2) Whelen warning lights, C6 SurfaceMax Series, Super-LED light heads shall be mounted on the rear of the apparatus below the taillights at the lower outermost corners in vertical position with a Whelen chrome plated flange.
The self-contained flashing light shall have 75 Scan-Lock™ flash patterns including steady burn with hi/low power. The C6LR will meet SAE J595 and J845 requirements.

These two (2) lights fulfill the requirements for Upper Zone C lower level warning devices. Both warning light lenses shall be red in color.

LED TRAFFIC ADVISOR

An LED traffic advisor shall be mounted integral to the rear horizontal grab handle, mounted centered high on the upper rear of the apparatus, beneath the hosebed if so equipped.

The Amber signal patterns of the device shall be progressive left, progressive right, center out, and emergency “All Flash.”
In addition to the Amber segments the outer left and outer right of the traffic advisor shall contain a red signal segment operating in concert with the left and right turn signals and the hazard flasher of the apparatus. In the center of the traffic advisor there shall be a red segment that illuminates when the vehicle service brakes are applied.

The switch control box is to be mounted in the cab allowing for easy operation by the driver and officer.

IDENTIFICATION AND SAFETY LABELS

A permanent plate shall be installed in the driver's compartment to specify the quantity and type of the following fluids in the vehicle:

Engine oil.
Engine coolant.
Transmission fluid.
Pump Transmission Lubrication Fluid.
Pump Primer Fluid (If applicable).
Drive Axle Lubrication Fluid.

Air-conditioning refrigerant.
Air-conditioning lubrication oil.
Power steering fluid.
Transfer case fluid.
Equipment rack fluid.
Air compressor system lubricant.
Generator system lubricant.

A permanent plate with pump performance data and serial numbers shall be installed on the pump panel.

A permanent plate shall be installed in the driver's compartment specifying the maximum number of personnel the vehicle is designed to carry per NFPA standards. It shall be located in an area visible to the driver.

An accident prevention sign stating "DANGER PERSONNEL MUST BE SEATED AND SEAT BELTS MUST BE FASTENED WHILE VEHICLE IS IN MOTION OR DEATH OR SERIOUS INJURY MAY RESULT" shall be placed so it is
visible from all seating positions.

An accident prevention sign stating "DANGER DO NOT RIDE ON REAR STEP WHILE VEHICLE IS IN MOTION, DEATH OR SERIOUS INJURY MAY RESULT" shall be placed so it is visible from the rear step of the vehicle.

If an inlet located at the pump operators' position is valved, it shall be provided with a permanent label with language per NFPA-1901, current edition.

WHEEL CHOCKS

One (1) pair of heavy duty, high tensile molded aluminum wheel chocks measuring 7.75" high x 8.5 wide x 15" long shall be provided with the apparatus. The wheel chocks shall have a bright yellow powder coat finish for high visibility, safety and corrosion resistance. No exception shall be allowed to these requirements.

Two chock holders shall be provided and mounted on the left side of the apparatus below the front body compartment.

REFLECTIVE SAFETY STRIPE

A 1" x 4" x 1" wide 3M brand Scotchlite reflective stripe shall be affixed to the perimeter of the vehicle. The striping shall be placed up to 60" above ground level and shall conform to NFPA reflectivity requirements. At least 60% of the perimeter length of each side and width of the rear, and at least 25% of the perimeter width of the front of the vehicle shall have

reflective stripe.

REFLECTIVE STRIPE COLOR

The apparatus body striping shall be white reflective.

The smaller accent stripe(s) shall be white reflective.

WATER TANK WARRANTY

The water tank is to be free from defects in material and workmanship for the normal service life of the apparatus in which
the water tank is installed.

If a tank has a defect in material or workmanship covered by the warranty, the tank manufacturer shall repair at their cost, by authorized personnel or authorized third parties. The tank manufacturer shall make an effort to effectuate repair within 48 hours following initial notification of a covered defect. The tank manufacturer shall make a reasonable effort to repair tank at most convenient location to end user.

The tank manufacturer shall reimburse all reasonable costs associated with rendering the tank accessible for repair, including, but not limited to, removal and reassembly of the hose bed floor.